MILITARY REVIEW

VOLUME XXXII JANUARY 1953 NUMBER 10

Editor in Chief
LIEUTENANT COLONEL D. L. DURFEE

North American Edition
Editor: MAJOR G. DRESSER
Assistant Editor: CAPTAIN R. H. HANSEN

Spanish-American Edition
Editor: LIEUTENANT COLONEL R. GIMENEZ-DE LA ROSA
Assistant Editors: MAJOR R. AMY, LIEUTENANT G. ENJUTO, WOJG S. COLLAZO-ZAYAS

Brazilian Edition
Editor: MAJOR O. J. BANDEIRA DE MELLO, *Brazilian Army*
Assistant Editors: MAJOR E. R. MAIA, *Brazilian Army*, MAJOR N. FREIXINHO, *Brazilian Army*

Administrative Officer
CAPTAIN A. HAALAND

Production Manager
CAPTAIN J. A. TRENT

CONTENTS

OUR AUTHORS ---- 2
THINKING AND WRITING ---- Col J. A. Gavin, *Inf* 3
MOUNTAIN OPERATIONS ---- Lt Col M. L. Powell, Jr., *Inf* 6
DENMARK AND THE ATLANTIC UNION ---- Maj Gen E. Kragh, *Danish Army* 16
CLOSE AIR SUPPORT CONTROL ---- Lt Col C. C. DeReus, *Inf* 20
THE ALLIED COMMAND, ATLANTIC ---- Lt Col R. C. Williams, Jr., *GSC* 33
WHY JAPAN'S ANTISUBMARINE WARFARE FAILED ---- Atsushi Oi 41
CARRIER STRIKE ---- 57
MILITARY NOTES AROUND THE WORLD ---- 63
FOREIGN MILITARY DIGESTS ---- 73
The Soviet Attack in Depth ---- 73
Air Warfare of the Future ---- 78
The Source of Military Morale ---- 89
Why Stalin Waits ---- 100
The Sabotage of Airfields by Airborne Troops ---- 104
Why Drill in Modern Military Training? ---- 107
BOOKS OF INTEREST TO THE MILITARY READER ---- 110

MILITARY REVIEW—Published monthly by the Command and General Staff College at Fort Leavenworth, Kansas, in the English, Spanish, and Portuguese languages. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rates: $3.50 (U.S. currency) a year in the United States and other countries of the Western Hemisphere: $4.50 a year in all other countries. Reprints are authorized, provided credit is given the "MILITARY REVIEW," CGSC, Fort Leavenworth, Kansas.

OUR AUTHORS

Colonel John A. Gavin served, during World War II, as Commanding Officer, Harmon Field, Newfoundland; Assistant G3, Headquarters, Army Ground Forces, Washington, D.C.; and as Executive Officer, G3 Section, Headquarters, Fifteenth Army, in Europe. In 1950, he commanded the 3d Battalion, 33d Infantry (later the 3d Battalion, 65th Infantry), and moved this unit to Korea in August. Upon his return to the United States, he was assigned as a student at the Army War College. Colonel Gavin is presently serving as G1, Academic Staff, Command and General Staff College.

Lieutenant Colonel Marcus L. Powell, Jr., served, during World War II, as a company commander, regimental S3, battalion executive officer, and battalion commander with the 4th Infantry Division. After the war, he was assigned to the New York-New Jersey-Delaware Military District. From 1948 until 1950, he served in Greece as Aide-de-Camp to General James A. Van Fleet. He graduated from the Command and General Staff College in 1951, where he has served as an instructor since that time.

Major General Erik Kragh is presently Chief of the Danish Army Staff and Chief of Staff to the Commander Allied Land Forces Denmark. During the war, he was a member of the Danish resistance movement against Germany. After the war, he served as G3 on the Army Staff; Chief Instructor of Tactics at the Danish Staff College. In January 1951, he was appointed the first Danish military representative to SHAPE. General Kragh is a graduate of the Danish Officers School, the Danish Staff College, and the Ecole Superieure de Guerre.

Lieutenant Colonel Clarence C. DeReus served, during World War II, with the 34th and 42d Infantry Divisions. After the war, he was a member of the Advisory Group, Korean Army. Upon his return to the United States, he attended the Advanced Course at The Infantry School, and then returned to Korea where he served with the 3d and 7th Infantry Divisions. He returned to the states in January 1952 and is presently a student at the Command and General Staff College.

Lieutenant Colonel Robert C. Williams, Jr., a graduate of the Command and General Staff College and the Army-Navy Staff College, served, during World War II, as battalion commander and division staff officer in the Mediterranean and Pacific theaters. Colonel Williams, at present, is the Assistant Director, Home Territories and Island Bases, Plans Division, SACLANT.

Atsushi Oi, a former captain in the Imperial Japanese Navy, graduated from the Japanese Naval Academy in 1923, and later attended the University of Virginia and Northwestern University. In 1940, he became Operations Officer, 2d China Sea Fleet, and in 1941 he served as a member of the Personnel Bureau, Navy Ministry. Later, he served as Executive Officer, 21 Special Base Force in Java; a member of the Operations and Police Bureau, Navy General Staff; and Operations Officer, Grand Escort Command Headquarters.

Thinking and Writing

Colonel John A. Gavin, *Infantry*
Instructor, Command and General Staff College

THE purpose of this article is to encourage career Army officers to avail themselves of every opportunity to reduce to writing their considered opinions on problems confronting them. At the outset, it should be self-evident that the ability to write in understandable language makes for clear thinking and a better Army officer.

When the career officer examines and studies the career pattern for an officer of his particular arm or service (as set forth in Technical Manual 20-605), he will note that he will be called upon to serve as a staff officer at various levels of command. He will realize also that his opportunities for troop command assignments decrease as his service lengthens. Hence, it should be apparent to the career officer that he is slated for various staff assignments at different command levels following his initial basic troop duty.

The Staff Writer

What is the implication involved? The answer should be obvious. One of the primary requisites for any able staff officer is that he must be capable of expressing on paper, in a clear, concise, and logical manner, the results of his personal analysis of a given set of facts, in the name of his commander or immediate superior. Whether his staff action calls for the preparation of an indorsement, a directive to subordinate commands, or a detailed staff study, the capability previously mentioned is ever present. He must be able to apply common sense reasoning to the facts given to him or obtained by his intelligent research, and reduce the results to understandable writing.

The Well-Written Directive

To be considered well prepared, a written directive must satisfy the questioning minds of the party or parties receiving it. Is the directive clear? Is it complete? Are there any "bugs" in it? Only when it satisfies the affirmative answers to these questions can the action staff officer feel that he has turned out a good job. Therefore, in order for the career officer assigned staff duty to be properly prepared to assume his duties, we conclude that he must possess the ability to express his thoughts in writing in such a manner as to be readily understood. Now we arrive at the crux of the matter. Is this ability one that must be developed before he receives high-level staff duty or can we assume it is inbred in the average career officer? Let us examine the question briefly.

Writing

The basic elements of writing are taught the officer during his grammar and high school days. Here he learns not to split the infinitive, how to paragraph and spell

One of the fundamental requisites for any staff officer is that he be capable of expressing on paper, in a clear, concise, logical, and understandable manner, the results of his analysis of a given set of facts

correctly, and how to avoid entangling sentences, as well as the many other fundamentals of grammar, punctuation, and composition.

During this period, his thinking is directed at following a given set of rules of grammar and punctuation. Little, if any, original thinking is required.

Thinking

The career officer's ability to think clearly and to arrive at a sound recommendation or decision concerning a problem is, in the author's opinion, based on two main factors: his common sense and his intelligence. In approaching a problem, he must so train his mind to recognize readily the facts pertinent to the problem at hand. By a studied analysis of these facts, he must arrive at the decision or recommendation required. He must be able to secure a firm mental grasp of the important facts bearing on the problem, and, by weighing the advantages and disadvantages of the lines of action open to him to resolve the problem, determine the one that will offer the best solution. Throughout this process of reasoning, the officer must assiduously avoid diverting his efforts down interesting paths which have little or no bearing on the problem under consideration. Here is where the element of common sense must be applied. The amount of intelligence possessed by the individual will be, in a large measure, indicative of the scope of the problem he is capable of undertaking.

Thinking and Writing

Now let us combine thinking and writing and examine the ability of the average career officer to express his thoughts in writing in such a manner as to be readily understood.

In his early commissioned days of troop duty, the young officer is faced with solving many problems. Seldom, however, do the solutions to these problems have to be reduced to writing. Most times they may be resolved through fragmentary oral or written directives. It may be concluded, therefore, that during this formative period there exists no requirement for the young officer to reduce to writing the results of his thought processes, other than in fragmentary or routine form. Unless this officer, on his own initiative, should make some attempt at placing his thoughts on paper as they may relate to a problem, he may find himself suddenly and unexpectedly assigned to a staff position, wherein he will be expected to prepare directives and studies based on facts and data presented to him without adequate preparation. It should be apparent, therefore, that any prior practical experience in the technique of good writing will be of substantial assistance to him in his newly assigned job. Otherwise, he must begin to apply himself diligently to the task of developing the art of clear, concise, logical writing.

It would be a fallacy to state that this development can be attained to a high degree in a short time. In fact, the time element will depend, to a large extent, upon the age of the officer at the time he starts to apply himself conscientiously in the field of writing. The younger, the better.

Conclusions

Based on the foregoing discussion, we may conclude that:

1. The basic elements of writing which require little original thought are taught the career officer in his grammar and high school days.

2. His ability to think clearly is based primarily on his intelligence and common sense.

3. There exists little requirement during his initial troop duty assignments for reducing his thoughts to writing.

4. His ability to place his thoughts in understandable writing is one of development to be attained objectively by displayed initiative on his part.

Suggested Remedy

The author's advice is for the career officer to commence writing, preferably on military subjects, as early in his career as possible. To overcome his natural reluctance to write, he must force himself to do so. His success as a staff officer or commander of an independent installation or unit will be measured to no small degree by the quality of the reports and studies rendered by him. It cannot be overemphasized that orderly thinking is fostered by the developed ability of clear, concise, logical writing.

Service Journals

Without question, the best outlets for expression of original thoughts by Army officers are our very excellent service journals. Here the opportunity is offered to all officers, regardless of branch or arm of service, to submit open and frank, thought-provoking articles on subjects which are military in nature. Comparatively few officers take advantage of this splendid opportunity to better themselves professionally by presenting, in written form, their considered views on a controversial or original subject. At the same time, those who do seize the opportunity are improving their ability to analyze facts, to research issues involved, and to arrive at their own personal conclusions on the problem involved. What better training in presenting his thoughts in writing could the young career officer possibly ask for in preparing himself for higher staff and command assignments?

Proper Form

The prospective author will improve his chances of having his manuscript accepted if he sends it forward in the proper form. Editors prefer two copies of a manuscript and all material should be either double or triple spaced. It is good practice to include a self-addressed envelope with the necessary postage to ensure the return of the work in the event it is not considered suitable for publication. However, the fact that the manuscript is rejected by one publication, or several for that matter, should not discourage the author for there are undoubtedly other journals which will be interested in the article. Therefore, if the manuscript is returned, it should be sent off to another publication without delay.

Tailor the Article

The type or class of reader of the magazine is a consideration which requires thought. A brief perusal of the publication in question should indicate the type of reader to whom it is directed. Therefore, it may be necessary to tailor or revise the article to fit specific publications. Even the best professional writers have rejections and occasionally have difficulty in marketing a particular piece of their work. Before it is considered a total loss, however, their work has generally gone the complete route of every magazine which carries the type of writing being offered. Frequently, comments will be received which, if incorporated, will improve the article and make it more acceptable.

In any case, the experience gained by the officer in the preparation is more important than any monetary consideration that he may receive. If first attempts fail, he should keep trying. Determination will eventually meet with success and past efforts will serve to point out deficiencies that must be overcome.

MOUNTAIN OPERATIONS

Lieutenant Colonel Marcus L. Powell, Jr., *Infantry*
Instructor, Command and General Staff College

IT IS often said that the tactical principles which govern combat in mountainous terrain are the same as those which govern warfare in other types of terrain. True though this statement may be, we have often accepted it as a fact too literally without making an effort to understand wherein their application differs. As a result, in each new campaign involving operations in mountainous regions, we have had to learn anew how to apply these principles. These lessons have usually come only after much bitter fighting with heavy losses in personnel, equipment, and prestige.

The purpose of this article is to analyze our offensive tactical principles and determine wherein and how their application differs when applied in mountainous terrain with respect to planning, control of operations, fire support, reserves, and logistical support.

To do this we must: first, consider the peculiarities or characteristics of mountain warfare; second, determine how the principles are applied in mountainous terrain; and, third, compare the application of our offensive tactical principles in mountainous terrain with their application in less difficult terrain.

Mountain warfare is characterized by:

1. *Limitations imposed upon movement by terrain.*

2. *Limitations upon the size of the forces which may be used.*—Such limitations are imposed by the numerous narrow valleys and defiles.

3. *Generally inadequate road nets.*—This increases the military value of existing roads, adds importance to the heights which dominate them, and slows down operations.

4. *Small unit actions.*—This makes the initiative and leadership of the subordinate commanders of the highest importance. Success in mountain operations is more dependent upon the proper adaption of available means to the terrain than upon outright power plays.

5. *Defending passes and valleys.*—The defense places its flanks on strong obstacles, on adjacent heights, and then pushes the flanks well forward along the heights to gain flanking fires in front of the defensive position.

6. *Centralized planning.*—The scheme of maneuver of the force as a whole is based upon detailed planning to ensure unity of effort and adequate and continuous logistical support.

7. *Decentralized operations.*—The Decentralization of operations is characteristic of mountain operations. Tactical groups usually operate semi-independently in the capture of terrain objectives.

8. *Limitations imposed on logistical support.*—Logistical support of a division operating in a mountainous area becomes more critical in its effect on the operation, especially pertaining to special items of equipment, supply, transportation, and evacuation.

Planning

The planning for mountain operations must be centralized and detailed. From the division point of view, planning must go down to include the infantry battalion

level. In order to support the assault units logistically, the regimental schemes of maneuver, reflecting the division commander's concept, must be approved in advance (after many conferences with the regimental commanders). So much of the regimental scheme of maneuver as is necessary to ensure unity of effort, full logistical support, and the carrying out of the division plan of attack must be included in the division order. By so doing, all agencies of the division are conversant with the details necessary for supporting the units.

Critical Terrain Features

Critical terrain features for both the defender and the attacker include heights which dominate the valleys and the lines of communication, passes which permit movement through mountains, and roads which are necessary for supply purposes.

On less difficult terrain, division objectives assigned as intermediate objectives include only those which have an influence on more than one major element of the division. An example of this is a hill mass near the boundary between two regiments, since it will affect the ability of both units to advance. The division, therefore, assigns it as an intermediate objective. In mountain operations, control of dominating heights, which could be used by the enemy for observation of the avenues of approach, must be secured. Therefore, division objectives must include all such heights.

In designating boundaries, the heights dominating the natural avenues of advance are given to the unit on whose zone of advance the heights exert the greatest influence.

Control of Operations

Centralized control is highly desirable in mountain operations but difficult to achieve as the irregularities of the terrain break the attack into relatively isolated actions. The reinforced battalion is ordinarily the largest unit which can be employed as a unit in the attack. Terrain barriers make communications difficult and unreliable; therefore, decentralized control is necessary in mountain operations. In general, the degree of centralization possible will be inversely proportional to the difficulties of movement and communications imposed by the terrain. Control will become a matter of preplanned operations carried out by semi-independent units.

Although decentralization of operations is characteristic of mountain warfare, and tactical groups usually operate semi-independently in the capture of terrain objectives, the scheme of maneuver of the force as a whole is based upon detailed planning to ensure unity of effort and adequate and continuous logistical support.

Fire Support

Decentralization of artillery support is characteristic of mountain warfare. However, whenever the terrain permits, the artillery is held under centralized control to facilitate ammunition supply and the massing of fires.

Mountainous terrain also imposes limitations on the number and types of infantry weapons that may be employed. At times, it may be necessary to eliminate some of the infantry supporting weapons because of supply limitations. In selecting the proper weapon, the following characteristics of each weapon must be

The same tactical principles which govern warfare in other types of terrain will govern combat in mountainous terrain. There are, however, differences in the manner in which these principles are applied

considered: rate of fire, accuracy, type of trajectory, weight of the weapon and its ammunition, transportability, range, and ease of concealment. Troops operating in mountains should have a preponderance of high-trajectory weapons.

Reserves

Because of the difficulty of troop movement in rugged terrain, the rapid employment of the division reserves is not always possible. However, the principle of the reserve is valid, and sufficient reinforcements must be withheld to maintain flexibility and to exploit unforeseen advantages. If the location of the reserves and the terrain permit, task forces are formed which push rapidly and deeply in the designated direction and initiate lateral movement against hostile forces which are holding up adjacent tactical groups. It is this flanking action against the enemy's lines of communication which will cause his withdrawal to become general, and change the action from exploitation of a local success by one tactical group to a pursuit by the entire force.

Since the terrain makes the rapid movement of the reserve very difficult, plans for its commitment must be prepared well in advance of the time of the expected action. A lack of lateral roads often dictates that the reserves be held well to the rear in order to attain the desired degree of flexibility. Where time and space factors make this undesirable, the reserve may be split with elements of it following each tactical group.

All terrain dominating friendly lines of communication by observation and fire must be seized as the attack progresses. The reserve must be used, if necessary, to ensure the seizure of such dominating terrain, even though it may be within the zone of a secondary effort.

An additional, but important, mission of the reserve in mountain combat is that of providing replacement battalions for the regiments operating along the ridges. The transfer of battalions between regiments may be more practical than the relief of a regiment, but this is done as seldom as possible in order to avoid complicating administrative support.

Logistical Support

Logistical support of operations conducted in mountainous terrain is aggravated by combinations of conditions, which increase the amount of effort necessary to effect logistical support, and, at the same time, lower the efficiency of the means available to render that support. Normal supply, evacuation, and transportation problems become critical factors whereas they would be quite routine in operations under less difficult conditions.

Unit Supply Dumps

In order to supply units with the minimum equipment essential to operations in mountains, it often becomes necessary to depart from the normal methods of supply procedure. In less difficult terrain, the setting up of supply dumps, within the division area, is seldom justified, except possibly Class III, and Engineer and Signal Class II and IV dumps. In mountain operations, it may be necessary and desirable to set up regimental, battalion, and even company dumps. Generally, the decision as to whether these dumps should be established is determined by the ability of the transportation facilities to maintain regular schedule delivery of supplies to the area. If a decision is made to establish small dumps, the question still remains as to whether the available transportation can build up a reserve in addition to supplying current needs.

Medical Service

In preparing an infantry division for mountain operations, collateral training and preparation of medical troops must not be neglected. The evacuation of the wounded in mountains requires a larger proportion of medical troops than in average terrain, skills which are not ac-

Mountainous terrain imposes critical limitations on the number and types of weapons and equipment that may be employed. Above, a United Nations mortar crew firing against the enemy in Korea. Below, medical aid men delivering a wounded soldier to a landing strip for subsequent evacuation to a hospital behind the lines.—Department of Defense photos.

quired in normal training, and certain special equipment. When snow and cold are encountered in mountains, the needs enumerated above are increased.

Road Nets

Roads are generally inadequate in mountain areas. The roads that do exist are usually narrow, making two-way traffic difficult. Sharp turns may prevent the use of trailers. Once good roads are left behind on which it is possible to employ general-purpose motor transportation, every effort should be made to use either existing or improved mountain trails for ¼-ton trucks. Often what would appear to be a precarious mule trail at first glance can, with the aid of engineer units and dozers, become a suitable one-way road for ¼-ton trucks. Under such circumstances, turnouts on such roads should be provided in order to permit, if possible, intermittent two-way travel, or else a traffic plan must be devised to enable continuous one-way traffic.

Supply by air is a valuable additional method of supply and may be utilized if sufficient planning time is allowed and aircraft are available. Air transportation is, in dollars, one of the most expensive methods of transporting troops, matériel, and supplies, and is normally reserved for emergencies or conditions requiring speed. Yet, routine or planned supply by air may be the cheapest method in those areas where surface communications are extremely difficult and adequate surface facilities do not exist. These conditions may exist in extremely rough terrain. Under these conditions, supply and evacuation by air may be the cheapest method from the standpoint of time, matériel, and man-hours which would be required to construct an overland communications system.

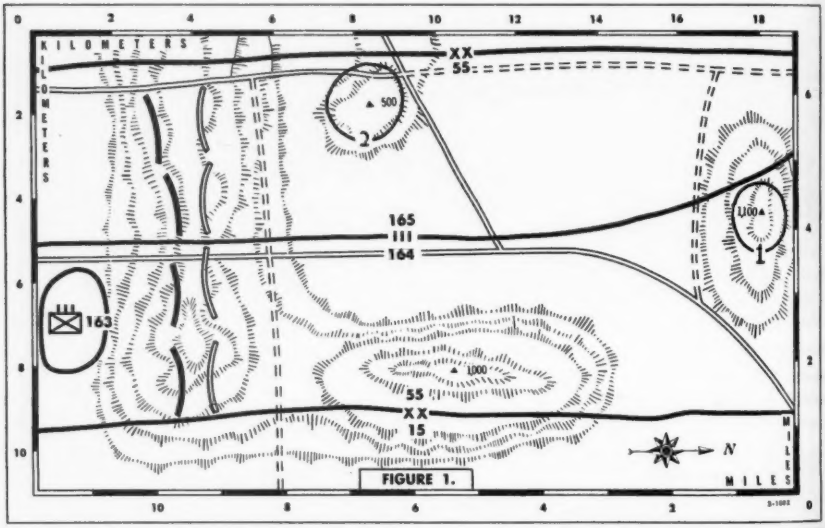


FIGURE 1.

Comparison of Operations

The differences between the application of our offensive tactical principles in mountain and in less difficult terrain can best be portrayed by example. The terrain

Mountain warfare is characterized by small unit actions whose success is dependent upon the proper adaption of the available means to the terrain. Above, infantrymen in Korea firing a .30-caliber light machine gun and a carbine prior to advancing. Below, a squad of American infantrymen manning a ridge in Korea.—Department of Defense photos.

shown in Figure 1 is considered average terrain by our Army school system, and imposes little restriction on movement, control, co-ordination, and support.

Figure 2 depicts mountainous terrain in which the application of our offensive tactical principles will vary from their application to the situation shown in Figure 1 with respect to planning, control of operations, fire support, reserves, and logistical support.

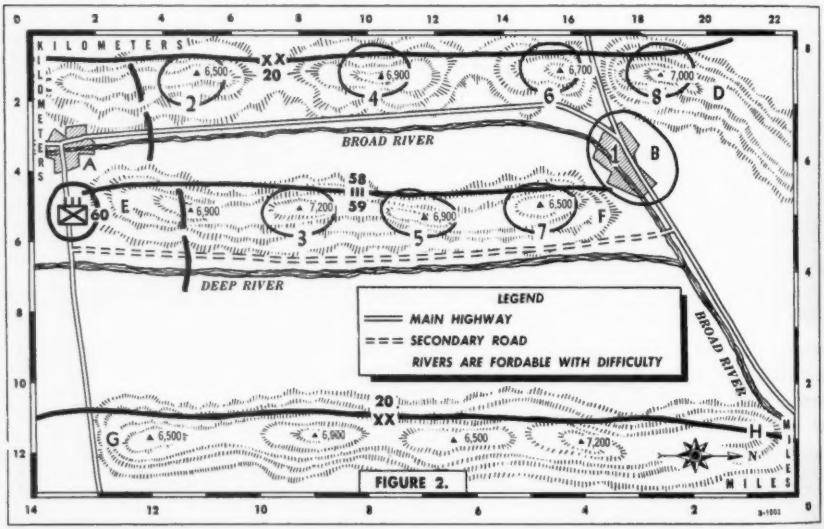


FIGURE 2.

Planning

In Figure 1, planning will be somewhat general, reflecting only the division scheme of maneuver. In Figure 2, planning will be centralized at division headquarters, and will be done in great detail. The regimental schemes of maneuver, reflecting the division commander's concept, will be detailed in order to ensure that the necessary unity of effort is obtained to remove dominant enemy observation from the road net which is required for logistical support. The detailed operation order also would enable division supply agencies to provide more efficient logistical support.

The critical terrain features in Figure 1 are Hills 1,000 and 1,100. The road net is not critical since it is not essential for logistical support. In Figure 2 the critical terrain features are:

1. Ridge C-D, on the west boundary, which dominates the Broad River valley and the main highway from the west. Hill 7,000 at the northern end of the ridge dominates Town B (the division objective) and the pass through the mountains.

2. Ridge E-F, in the center of sector, which dominates the Broad River valley and the main highway on the west, and the Deep River valley and the secondary road on the east.

3. Town B, which is an important road center controlling the pass through the mountains at this point.

4. The main highway from Town A through Town B and the secondary road along the Deep River valley. These roads are necessary to ensure adequate logistical support as the attack progresses.

The logistical support of operations in mountainous terrain is restricted by the effort required and the means available to render that support. Above, *C-119 Packets* dropping supplies to a unit isolated in a mountainous area in central Korea. Below, South Korean volunteers carrying supplies to United Nations units.—Department of Defense photos.

The Broad and Deep Rivers are not critical terrain features, but they do have some value as obstacles in that they limit maneuver in the valleys. Troops cannot hold a river, but they can hold the ground which dominates it and increase its value as an obstacle. At the division echelon of command, a river is not a critical terrain feature unless it is needed for logistical support. In this case, neither the Broad River nor the Deep River is required for supply purposes.

In Figure 1, no intermediate objectives are assigned to the 164th Infantry Regiment, which is making the main effort. The 165th Infantry Regiment, which is making the secondary effort, is assigned an intermediate objective—Hill 500. The seizure of this objective will enable the secondary effort to perform its mission of rendering maximum assistance to the main effort. In Figure 2, all heights dominating the lines of communication are assigned as intermediate objectives. Their seizure is essential to ensure continuous logistical support.

In Figure 1, the boundary between the 164th and 165th Infantry Regiments is drawn so as to provide a frontage in conformance with the scheme of maneuver, to be easily recognizable on the ground, and to assign the main highway to the unit having the greater need for it. In Figure 2, these considerations are secondary to the assignment of dominating heights; therefore, the boundary between the 58th and 59th Infantry Regiments is located so as to give Ridge E-F to the 59th Infantry Regiment, since this ridge exerts the greatest influence on the 59th Infantry Regiment's zone of advance.

Control of Operations

The 55th Infantry Division, in Figure 1, can maintain a relatively high degree of control since terrain imposes few limitations on communications and movement. However, in Figure 2, the 20th Infantry Division must decentralize control to its assault regiments because of the terrain barrier in the center of the zone which will make communications difficult and unreliable as the attack progresses.

Fire Support

In Figure 1, the 55th Infantry Division will be able to hold all of its supporting artillery under centralized control and shift fire support from one unit to another as the situation demands. In Figure 2, the terrain barrier (Ridge E-F) will require the 20th Infantry Division to decentralize its artillery support, having portions of it follow behind each assault regiment. Control over the battalions could best be exercised by having the division artillery headquarters control the artillery battalions following behind one regiment, and forming a provisional group headquarters to control the battalions following the other regiment. In this situation, the massing of fires by all supporting artillery would be difficult, if not impossible.

Reserves

In Figure 1, the 55th Infantry Division locates the reserve so as to be immediately available for employment and to favor the main effort consistent with security. The terrain will permit the movement of this reserve to any portion of the division zone very quickly.

In Figure 2, however, the 20th Infantry Division must hold its reserve farther from the point of action to retain flexibility. Lack of lateral road nets may require the 20th Infantry Division to hold its reserve in its present location until the seizure of Town B can be foreseen. This, of course, will depend on the progress of the assault regiments.

Logistical Support

In Figure 1, the 55th Infantry Division has no problem so far as logistical support is concerned. Normal supply point distri-

bution will be used and the supporting units will be under centralized control.

The terrain in Figure 2, however, will prevent the 20th Infantry Division from rapidly shifting those supporting means which are placed forward of the lateral road net. Therefore, it will be necessary to decentralize control of some of the supporting units.

For the assault regiments, all supplies should be delivered by the division as far forward as 2½-ton trucks can operate. This will allow those units to concentrate on moving supplies forward and will conserve manpower.

The regiments should use unit distribution, and deliver supplies to battalions and even to companies, if necessary. It may be desirable, if one battalion is widely separated from the remainder of the regiment, to give the battalion its own supply and evacuation means. The division should continue drawing supplies and equipment from army supply points, using normal supply point distribution to the remainder of the division elements.

Conclusion

Although the same tactical principles which govern warfare in other types of terrain also govern combat in mountainous terrain, there are differences in the application of these principles. Therefore, we must study and thoroughly understand these differences, both in our school system and in individual study, in order to avoid the costly method of learning through experience, after an operation has begun.

We have accomplished great improvements in our weapon systems since the day of the bow and arrow. There will be many improvements in the years ahead. It is my belief that neither the great improvements of the past nor those of the foreseeable future will alter the basic military truth that all arms are auxiliary to the foot soldier. "The man who walks on the ground" remains and will remain the controlling factor in forcing an enemy to do our will. His arms will remain basically what they are today. The support he needs will be rendered with devices basically as they are today.

Admiral William M. Fechteler

Denmark and the Atlantic Union

Major General Erik Kragh, Chief of Staff, Danish Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

DENMARK'S importance for the collective Western European defense is conditioned by her geographical position, which thus allots her role within the Atlantic Union. Therefore, it will be necessary to examine first the purely strategical conditions.

As we know, the European section of the Atlantic Union comprises three main areas: Northern (Denmark and Norway), Central, and Southern Europe. Or, stated in another way: a central area, mainly land and air territory, and two flank areas, one in the north and south where the sea plays an important role—the Atlantic Ocean, the North Sea, and the Baltic Sea in the north, and the Mediterranean Sea in the south.

The direct military connection between the central area and the two flank areas is limited. In the south, northern Italy is separated from the central area by the Alps. In the north, Denmark is attached to the central area by the restricted Schleswig-Holstein-Hamburg area.

Air Strategy

The Soviet occupation of airfields in Denmark would give her definite advantages in aerial warfare against Great Britain and particularly against shipping in the North Sea and the North Atlantic.

Even with the great radius of action of modern bombers, it would be an advantage to be able to advance one's airfields as far forward as possible. By so doing, time and fuel would be saved, and there would be less wear and tear on material and personnel. In this way, attacks could be pressed deeper into enemy territory. The same rules apply to guided missiles. It would be of even greater importance for both contestants to be able to push forward radar warning systems for fighter defense in Danish territory.

Naval Strategy

The geographical importance of Denmark, however, is of even greater significance from a naval point of view. It is known that the Soviet Union is building a modern battle fleet in which a considerable number of modern submarines is included. The possibility must be reckoned with that with this fleet the Soviet Union will attempt to cut, or at any rate to disrupt as much as possible, the lines of communication between the United States and Europe, and, especially, to impede the supplies vital to Great Britain. In order for the Soviet naval forces to carry out such operations, it will be necessary for them first to reach the high seas, which, in the case of the Soviet Baltic fleet, presupposes passage of the Danish straits (the Great Belt and the Sound). In this case, the possession of Danish territory will be of the utmost importance to the Soviets, as naval operations from Danish-Norwegian territory will be far more advantageous than from the Mur-

mansk area; if only because of the distance involved. Possessing Danish and Norwegian territory, the Soviets would be able to operate their submarines from Danish and Norwegian harbors. At the same time, their air force would be able to co-operate with the submarines from Danish and Norwegian airfields. During the last war, the Germans organized a similar co-operation by sending aerial reconnaissance far out over the Atlantic. The aircraft summoned packs of submarines by radio whenever a convoy was sighted.

Land Strategy

As previously stated, the strategic position of Denmark, in relation to air and sea warfare, is of primary importance. Nevertheless, for this importance to be realized, a land campaign must be successfully concluded first. As General Eisenhower has said "Only the infantryman can conquer land areas . . . and have complete direct control over a hostile population." Stated in another way: Denmark cannot be conquered by airplanes or warships—an attack must be made by ground troops to secure this ground.

It is obvious immediately that the Atlantic Union must be vitally interested in denying Denmark's territory to the Soviet Union as a base for air and naval operations. A Soviet conquest of Denmark would also mean that the Western European front would be broken, and the defense of the central area would be made more difficult. It would mean there would then be a definite threat from the north instead of a secure flank.

We thus come to the role Western Germany is to play in the Atlantic Union. The loss of Germany and possibly the adjacent areas of Belgium, Holland, and France would mean an almost catastrophic strengthening of the Soviet position in regard to manpower and industrial capacity (among other things the Ruhr district) and, under the most favorable circumstances, the war would be prolonged indefinitely. Therefore, it is essential that all efforts must be directed toward holding as large a part of Western Germany as possible.

Denmark's Concern

The defense of Western Germany is of particular importance to Denmark. By holding Western Germany, Danish participation in the Atlantic defense will be considerably facilitated, as direct attack up through the Jutland Peninsula would be out of the question, and any Soviet amphibious attack on Zealand would be far more difficult to achieve. On the other hand, a possible Soviet advance over the Elbe and the subsequent conquest of the Hamburg area would mean that Denmark would be cut off from direct connection with the military forces of the central area, and a direct attack on Jutland would be possible. At the same time, the danger of an amphibious attack against Zealand would be increased.

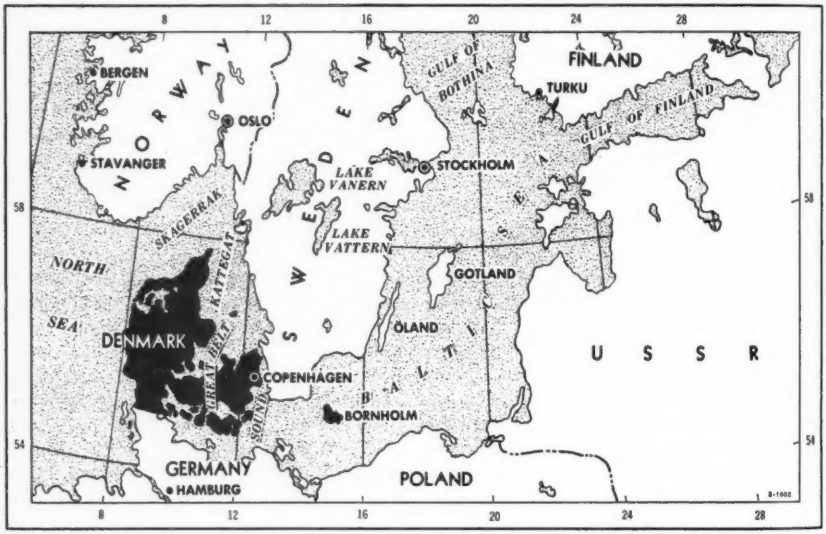
In case of a Soviet advance into Western Germany, the importance of Danish territory would be increased, as a successful defense which denied Danish territory to the Soviets would prove that the northern flank could hold. This threat from the north would limit the Soviet advance in Western Germany and would impose upon them greater caution, perhaps to a point where considerable Soviet forces would be required to ensure against a flank attack from the north. At the

Denmark is geographically located so that access to her land, sea, and air bases is vital to the security of Northern Europe and, in turn, to the defense of the Western European nations within the Atlantic Pact

same time, better conditions would exist for a Western counterattack in the central area.

Danish Policy

Denmark's adherence to the Atlantic Pact has two sides—the problem it has entailed for Denmark, as well as those it has entailed for the Atlantic Union in general.



Ever since Napoleonic times, Denmark has followed a policy of neutrality. The Danes have no wish to conquer, and are not interested in involving the country in the conflicts of the larger powers. This policy succeeded during World War I. However, the country was occupied by the Germans for 5 years during World War II. Gradually, as the new imperialistic threat after the last war became more and more apparent, responsible political circles were faced with the problem of deciding upon a policy to be pursued. The strategic importance of Denmark's geographical location was so great that all hope of remaining neutral in a war between the East and West was not feasible. The establishment of defenses adequate to ensure neutrality was impossible from the economic standpoint as well as the size of the country. This created a strong desire for a Scandinavian defense league between Denmark, Norway, and Sweden, which had to be abandoned because the acquisition of the necessary military equipment and supplies was not possible. Therefore, if Denmark is to survive as an independent state, and preserve the democratic liberties and rights that for many generations have meant so much to the Danish people, she must join the Atlantic Union.

By this alliance with other free states in Western Europe and with the United States and Canada, Denmark has gained powerful friends and thus a chance to build up a real defense—this would have been impossible without American arms aid. Further, by adhering to the Atlantic Pact, Denmark has obtained a certain preventive security—for an attack on Denmark now is an attack on the Atlantic Union.

The Atlantic Pact

The Atlantic Pact provides rights and obligations. Denmark has recognized her obligations and is planning a defense program which is within the country's economic and personnel resources but is far greater in size than heretofore. We realize that we ourselves must make the greatest effort to defend the country—only by so doing can we expect outside help. On the other hand, we do expect this help from our allies as the defense forces of the Atlantic Union are gradually extended. However, this must be clearly understood: a policy which aims at first evacuating certain parts of Western Europe in order to later liberate them is not acceptable to Western Europeans dwelling in these areas. A foreign occupation involving dictatorship, deportations, and secret police will leave behind nothing worth liberating. The idea must be to keep out the aggressor, for only by so doing can the peoples of Western Europe be given faith in the justification of the Atlantic Pact. It must be remembered that after two wars and several economic crises the peoples of Western Europe are weary, and the idea of a foreign occupation would dishearten them.

Conclusion

Denmark's adherence to the Atlantic Pact increases the burden of the allies by including a difficult area to defend but one which provides a great strategic advantage if the northern flank of Western Europe is to be included in the common defense. Denmark's strategic position on the northern flank as a factor cannot be overemphasized in regard to the defense of Western Germany or in regard to impeding the naval forces of the aggressor in reaching the North Sea and the Atlantic Ocean.

The understanding of the Atlantic Pact is becoming more and more widespread throughout Denmark, and the preponderance of Danish public opinion supports adherence to the pact. The great majority, which is aware of the threat from the East, feels grateful for the United States' contribution both in respect to the Marshall Plan and the Mutual Defense Assistance Program.

Dec 1953

We have learned that negotiating with Communists, and especially the Soviet Union, requires all the patience that free men can muster.

On the other hand, we do have certain credit in the military bank.

We have staunch and true allies, with common ideals of freedom.

We are members of the finest collective security arrangement the world has ever known—the North Atlantic Treaty—designed for peace, getting stronger every day.

General of the Army Omar N. Bradley

Close Air Support Control

Lieutenant Colonel Clarence C. DeReus, *Infantry*
Student, Command and General Staff College

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE control of tactical aircraft has today replaced the merits of the horse as a favorite topic of conversation among military men. This is fitting, since tactical air support provides an extremely mobile, hard-hitting force, and is substantiated by the fact that tactical air support is a salient factor which may determine the outcome of a decisive action.

THE PRESENT SYSTEM

Reams of copy have been written on the various control systems, the value of tactical air support, and its successes and failures. Unfortunately, more space has been devoted to what has been called frictions and failures rather than successes. There still exists, however, a great variance of opinion as to the employment of tactical air support. This spread of opinion does not exist on the effectiveness of air support, but, rather, upon its control.

As is true of any supporting weapon or arm, control in placing the fire on the target is the critical test of its effectiveness. If you prepare to place artillery fire on a target close to friendly troops, the fire direction center will immediately ask if it is observed fire. An observer must be immediately available who can see the target and communicate with the unit controlling the weapon that is delivering the fire, to assure accurate fire and reasonable safety. With this fundamental in mind, let us examine the system of controlling fighter aircraft today.

TACTICAL AIR CONTROL PARTY

The *Joint Training Directive for Air-Ground Operations*, published jointly by the Army Field Forces and the Tactical Air Command, states that a tactical air control party (TACP) consists of four men, one of whom is to be a combat experienced pilot. This team is organized to direct close air support strikes in the vicinity of forward ground elements by visual methods. This directive dwells on the matter of allocation of control parties to ground combat units. In essence, TACPs will be assigned "as needed." This directive also deals in detail with added control elements such as the tactical air direction center. This article does not propose to discuss these elements, but, rather, *the close control with which the TACP is concerned.*

To point up some of the problems and to provide a basis upon which to recommend a more practical system, two examples of recent action in Korea are presented. These actions were similar in that they were offensive in nature, involved independent battalion missions, and had available adequate supporting fires and ample aircraft. With these points, however, the similarity ceased.

Cognizance must be taken of the fact that only one TACP for each regiment had been allocated to control tactical aircraft, because of a shortage of Air Force personnel. It is around this single point that this entire discussion is centered.

FIRST EXAMPLE

A battalion raid was planned against an enemy-occupied strong point, approximately 6,000 yards beyond the front lines, for the purpose of taking prisoners (see Figure 1).

The Plan

H-hour was set at 0600, and a battalion of light artillery, plus a single battery of medium artillery, was displaced to front-line positions to support the action. A tank company was attached to provide close, direct fire support. Four preplanned air strikes were requested and approved. These strikes were to be delivered at H minus 20, H plus 30, H plus 90, and H plus 120. The initial strike was to be directed against the objective area. The other strikes were to be delivered on key terrain features overlooking the objective from which the enemy could observe and direct fire. It was contemplated that targets would develop, during the initial stages of the action, upon which to direct the air strikes. The artillery was to be employed in close support of the infantry. An artillery preparation was to be employed prior to and in the early stages of the attack. A limited, flanking smoke screen was to be fired by supporting mortars. Plans were rechecked at 1800 the day before the raid was to take place, with the artillery liaison officer, TACP, and attached commanders.

Preparations

Movement to the assembly area was completed the following morning by 0500. Movement forward to the line of departure was made under a slight ground haze and the initial portion of the artillery preparation was started on schedule. Overhead the airborne air controller (Mosquito) checked in by radio with the TACP. His observation of the objective was excellent, but the valleys and lowlands were obscured by haze. From the observation post, the artillery liaison officer adjusted on the air target preparatory to marking it. The forward observer with the leading company was unable to observe the area through the haze.

Initial Air Strike

The initial flight of aircraft arrived on schedule and the TACP, in the battalion observation post, directed the strike. Target marking was rapid and effective. The strike was conducted with maximum effectiveness. The battalion commander requested the TACP to alter the direction of attack to facilitate the attack on one specific bunker and this was immediately relayed to the flight. They complied and scored a direct hit with the second aircraft attacking the position. The armament carried was as had been previously requested, and intelligence personnel observing with a scope reported the enemy fleeing from the bunker on the route of advance of the left company. This information was relayed from the TACP to the Mosquito who immediately picked them up and kept them under observation.

The artilleryman, who works with the infantry, provides their artillery fires, and understands their needs, is better able to co-ordinate the air-support requirements of a ground unit than an Air Force observer

As the aircraft notified the TACP of the completion of the strike, the artillery was alerted to fire the last of its preparation. The advance elements of the infantry crossed the line of departure. The right company moved quickly through the haze and the smoke screen along its route of advance. The left company drew automatic weapons fire soon after cross-

ing the line of departure and its advance was slow and difficult from that point on. In moving through the ground haze the right company bypassed two enemy positions which later gave it trouble.

Second Air Strike

The envelopment of the enemy position planned by the right company appeared to be a complete success. The company commander reported being in position on the ridge leading back from the objective, but this report was followed immediately by one reporting heavy enemy fire from his front and right flank. Particularly heavy was the fire from weapons (estimated to be three 75-mm mountain field pieces) emplaced on the high ridge line behind the objective. Their approximate position coincided with tentatively planned air targets. These guns were located on the topographical crest of a razorback ridge, hence, artillery could not effectively engage them. An immediate call for aircraft by the TACP proved beneficial and aircraft were over the target within 5 minutes. Although the target could not be marked by ground weapons, the TACP (operating at battalion level contrary to existing orders) described the specific points accurately and the Mosquito marked them effectively with smoke rockets. Initial runs by the aircraft were for purposes of orientation. After minor corrections by the TACP, they conducted an extremely effective strike. Although the target was not hit directly, it was neutralized completely and no fires were received from that position that day.

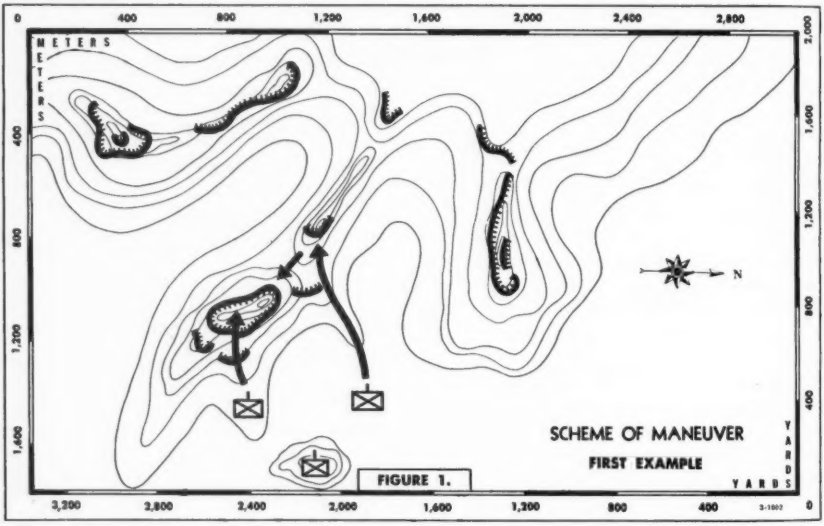


FIGURE 1.

Other Supporting Fires

Although enemy artillery fire had been lifted from the company in difficulty, mortar and added automatic weapons fire continued to prevent advance and to cause excessive casualties. Direct tank fire was brought to bear on the located targets and suspected areas. An area search for the enemy mortars was conducted by artillery and mortars, and although it was partially effective, it was prohibitive from the viewpoint of ammunition supply.

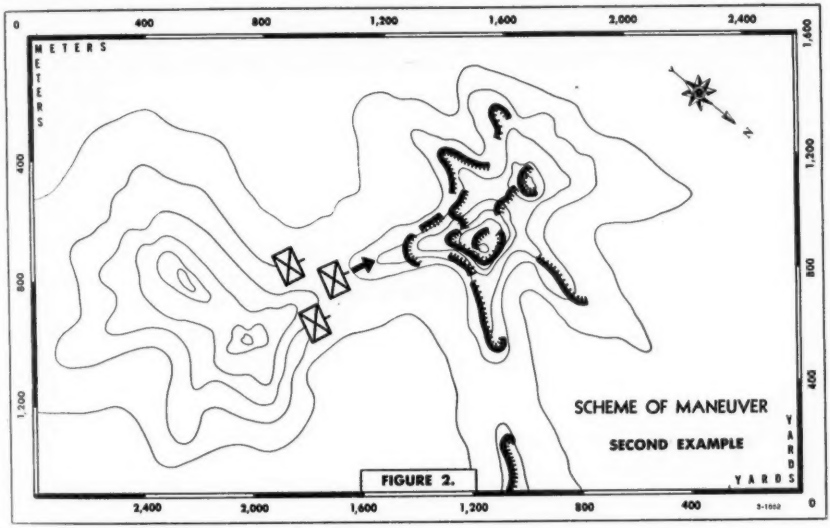
The TACP was directed to request detailed reconnaissance of the area by the Mosquito, and the light aircraft of the division were put to use searching the area. The advance of the left company continued to be slow but determined for its forward movement was limited to the speed with which the successive bunker strong points could be reduced. Supporting fires were of little value on this flank because of the close fighting, however, they did prevent reinforcement of the enemy. The most critical action continued to be on the right flank of the zone.

Third Air Strike

The third flight of fighters arrived simultaneously with a report from the division light aircraft which indicated that the enemy was preparing for a counterattack against the right company. This company had been unable to better its position. The location of the enemy was given by relay through the TACP. The planes quickly picked up the enemy movement.

A query by radio to the pilots determined that the aircraft were armed with napalm and rockets. They were requested to "dump the load" on the enemy concentration. The progress of the strike reports from attacking aircraft, division light aircraft, and the Mosquito attested to its effectiveness. All reports were in the form of monitored excerpts from conversation on very high frequency radio picked up by the TACP; they proved to be an accurate, rapid, source of information. During the time which the air strike was in progress, enemy fires lessened sufficiently to permit the company to reorganize. Casualties were started to the rear. This operation had been impossible earlier. A part of the company had to be utilized to reduce the bypassed enemy positions in the rear of the company.

Prisoners which were captured indicated that the entire position had been reinforced 24 hours earlier and was being defended by a battalion. The enemy concentration which had been attacked by napalm was an understrength battalion



(effective strength estimated at 200) which had served as a reserve. Other prisoners, taken by the left company, verified this report.

Since the battalion mission had been accomplished when prisoners were captured, the decision was made to break contact, with the right company withdrawing first, while the left company continued to maintain pressure.

Final Air Strike

Supporting fires were planned to assist this movement. The remaining air strike was to attack two key points to the right front and right flank of the battalion zone which necessitated splitting the flight. This plan was radioed to the fighters upon arrival. Targets were identified by description. The direction of attack was to be designated by the supporting artillery and mortar fires being placed on selected targets. As the company cleared its position, supporting fires were to be shifted there. Although the plan was quickly conceived, it was executed without an error and contact was broken quickly. As the covering force withdrew from the ridge line, the enemy followed quickly in an attempt to pursue the withdrawing forces. A radio call from an attacking aircraft was received requesting permission to attack the vacated ridge-line position with one remaining napalm tank. Permission was granted and a direct hit was made on the enemy gathered there.

The balance of the withdrawal was completed without incident. A detailed questioning of the prisoners captured indicated that the heavy artillery and air attacks had been devastating. The initial air strike had scored a direct hit upon a position, killing five men. Interrogation also verified that attacking aircraft had disorganized and scattered the unit preparing for the counterattack. Although confirmation could not be obtained, prisoners estimated that this force had suffered 50 percent casualties.

Summary

The operation had been conducted with the closest possible co-ordination between the supporting elements and the assault units. Their plans had been well laid, and each element had played its part well. Communications had worked well and changes in plans had been made, when necessary, without difficulty. The commander had been able to maintain complete control of the entire situation through the representatives of the supporting elements that were with him at the observation post. An operation which might have proved disastrous had been conducted soundly and simply. The air had been the deciding factor in the operation, providing the support when and where it was most needed through co-ordination effected by the TACP which had accompanied the battalion commander.

SECOND EXAMPLE

An infantry battalion had made a night approach of approximately 7,000 yards through lightly held enemy territory to a forward assembly area. It was to move at daylight to attack an objective 2,350 feet high and some 3,280 yards away. The first and second day attacks had uncovered a position held in force with the final objective heavily defended and exceptionally well dug in. These positions had a minimum of 4 feet of log and dirt cover overhead.

The Plan

On the afternoon of the second day, plans were being laid for the capture of the final objective the following day. Participating in the planning were the battalion commander, his artillery liaison officer, tank commander, S3, and weapons company commander. The TACP allocated to the regiment was at the regimental command post behind friendly lines and some 8 miles away. Instructions which had been issued directed the TACP to remain at the regimental command post. The plan formulated committed one company to the

As is true of any supporting weapon or arm, control in placing the fire on the target is the critical test of its effectiveness. Above, American field artillery observers directing artillery fire by radio near Wonchon, Korea. Below, American tank fire being radio-directed by Marine Corps observers in Korea.—Department of Defense photos.

attack along a narrow ridge line with two companies supporting its attack with fire initially from positions about 600 yards away (see Figure 2).

Artillery preparations were planned for the period from 0530 until jump-off time at 0700. Heavy harassing and interdiction fires were to be fired during the night and prior to the attack.

Tentative plans were made for air strikes to be brought in at H minus 20 with the planes making a final "dry run" after the infantry had started to move, thus keeping the enemy down for a few extra minutes. Prior action and a study of positions captured previously indicated that aircraft armament should include napalm, since only direct hits by fragmentation bombs had been effective. Therefore, requests for armament loads were made.

Preparations

Supporting fire plans were completed by 1700 of the second day. Approval of the entire operation, including the fire support plan, was phoned forward about 1900 to the battalion commander on the same day, and orders were issued to all subordinates prior to darkness.

During the night, two company-size enemy counterattacks were repelled by the employment of extremely heavy unobserved fires. Portions of the wire communications were cut, but nothing which materially affected the following day's plans transpired.

At 0530, the artillery preparation started on definitely located targets and its effect was excellent. At 0630, the airborne air controller (Mosquito) arrived as planned over the target area and checked in by *SCR 300* radio. He was briefed by radio, targets were described generally, and arrangements were completed by marking targets by recoilless weapons firing white phosphorus rounds. The Mosquito then asked for all supporting fires to be lifted in the entire area as the planes were on their way in. Fires were lifted and all was in readiness for the air strikes.

First Air Strike

Panels were displayed, recoilless weapons to mark specific targets were loaded and zeroed, and the wait started—and so did the enemy fires, since it was assumed that the attack had begun. At 0700, the companies were ordered not to move until further notice. At 0720, the Mosquito advised that he had been in contact with the wrong flight of fighters and he was now calling a second flight scheduled to arrive in about 10 minutes. At 0735, a flight of *F-80s* arrived over the area armed with .50-caliber machine guns, and 260-pound fragmentation bombs. Targets were marked as prescribed and remarking was necessary since it had not been observed by the aircraft. Communication with the Mosquito was unsatisfactory. The Mosquito observer did not monitor the *SCR 300* net continuously, remaining instead on the very high frequency channels. Hence, he could not be contacted when desired.

The target was remarked satisfactorily and the initial bomb runs were made. All bomb hits were beyond the target. Corrections could not be radioed to the airborne air controller as he failed to monitor the *SCR 300* net. After completing the initial target run, the planes rendezvoused and disappeared, presumably into the sun to prepare for another target run. At 0740, the airborne air controller advised that the aircraft were low on fuel and had returned to base. The air strike had been completed.

Other Supporting Fires

An alternate, preplanned, short, violent artillery and mortar preparation to be followed closely by the assault troops was placed in effect. This preparation could start at 0810 at the earliest. A re-

Tactical air support provides a mobile, hard-hitting force and is a salient factor which may determine the outcome of a decisive action. Above, an *F-84F Thunderjet*, loaded with bombs, supporting an infantry advance. Below, a burning *T34*, victim of a napalm bomb attack by Air Force fighters in Korea.—Department of Defense photos.

port of the air strike was phoned to the regimental commander, who relayed it, with adjectives, to the fire support co-ordination center (FSCC) at the division artillery command post. A sound conclusion arrived at by the division artillery S3 in the FSCC concluded that there existed a touch of dissatisfaction within the ranks—phones and radios jangled and buzzed.

Second Air Strike

At 0810, the artillery preparation started and at 0825 the assault elements were to move. At 0820, a flash call over the artillery radio channels requested the artillery to cease fire immediately—four *F4U* fighters loaded with rockets and napalm appeared overhead. The Mosquito came on the air control channel and asked for a remark of the target and a new air strike was underway. Hurried calls stopped the forward movement of the infantry, now out of their holes and ready to move. As the artillery lifted, in came the enemy fire.

The air strike lasted 15 minutes and no co-ordination could be effected to request a "dry run" to cover the initial forward movement of the infantry. As the aircraft departed, the infantry moved forward. Out of the depths of their positions came the enemy. Only two known enemy strong points failed to respond with the usual vigor. Reports of casualties from enemy fire began to come in. The infantry's day had started.

At the conclusion of that day the objective had not been taken, casualties were high, and a later study and prisoner interrogation proved that the air strikes had not neutralized a single position.

Summary

The detailed co-ordination vital to the success of this operation had been absent and the available support could not be utilized properly because of the failure of communications. Units in contact could not transmit their needs to anyone who was capable of accomplishing them. The commander on the ground was subordinated to a supporting element at the stage when he most needed to be completely in control.

A COMPARISON

A summary of these two actions indicates that in both, maximum fire support was planned in an effort to assist the forward movement of infantry. In both instances, the enemy had strongly prepared, heavily manned positions. In both actions, the artillery provided excellent fire support, ably co-ordinated and controlled by the forward observers and the liaison officer. In both instances, the employment of close air support figured heavily in the plan, yet in one it failed and impeded rather than aided the action.

In the first example, air support was obviously the power which tipped the balance toward success. It must be assumed that the presence of the TACP with adequate communications equipment was one of the major differences in the two operations. Through the medium of very high frequency radio, an exchange of information took place that made the first action successful. The absence of such facilities contributed to the failure in the latter action.

THE PROBLEM

A study of operating procedure indicated that at that particular period of the conflict in Korea, fighter pilots acting as TACPs were instructed to remain at the regimental level. The number allocated (one for each regiment) indicates that intention. It is most unfortunate that a weapon of the import of close-support aircraft should have the weak line of its control system at the very point on the ground where control is most important. Moreover, satisfied customers cannot be developed without an intelligent,

co-operative salesman present at the scene of action.

A SOLUTION

The following is proposed to provide a workable solution: Designate the artillery liaison officer with the infantry battalion as the tactical air controller. Allow him to be assisted by his forward observers with the rifle companies on the actual control and observation if the situation permits. Provide the artillery liaison officer with adequate portable very high frequency radio equipment and an additional man or two to operate and carry it. Add to the communication equipment of the direct support artillery battalion a suitable vehicular mounted very high frequency radio. These added items of communications are the only ingredient necessary to provide a sound workable system for requesting and controlling air strikes (see Figure 3).

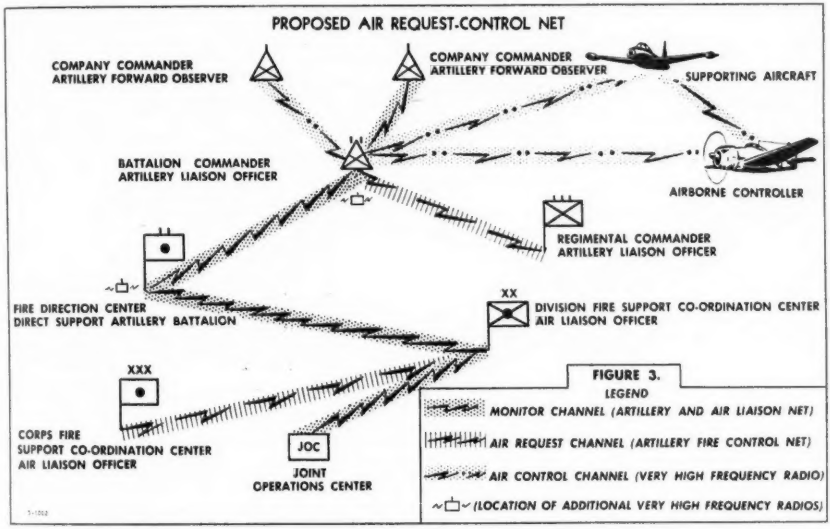

PROPOSED AIR REQUEST-CONTROL NET
COMPANY COMMANDER ARTILLERY FORWARD OBSERVER
COMPANY COMMANDER ARTILLERY FORWARD OBSERVER
SUPPORTING AIRCRAFT
BATTALION COMMANDER ARTILLERY LIAISON OFFICER
AIRBORNE CONTROLLER
REGIMENTAL COMMANDER ARTILLERY LIAISON OFFICER
FIRE DIRECTION CENTER DIRECT SUPPORT ARTILLERY BATTALION
XX
DIVISION FIRE SUPPORT CO-ORDINATION CENTER AIR LIAISON OFFICER
XXX
CORPS FIRE SUPPORT CO-ORDINATION CENTER AIR LIAISON OFFICER
JOC
JOINT OPERATIONS CENTER
LEGEND
MONITOR CHANNEL (ARTILLERY AND AIR LIAISON NET)
AIR REQUEST CHANNEL (ARTILLERY FIRE CONTROL NET)
AIR CONTROL CHANNEL (VERY HIGH FREQUENCY RADIO)
(LOCATION OF ADDITIONAL VERY HIGH FREQUENCY RADIOS)

FIGURE 3.

The Artillery Liaison Officer

Under the present system, requests for air strikes first arrive in artillery channels at the division fire support co-ordination center. The request is then viewed to determine if artillery could engage the target and if it is a remunerative air target. Once approved, it is forwarded to joint operations center at army for action. Why place it in artillery channels in the middle of its trip? Start it with the artillery liaison officer who is present with the commander on the ground. Who is better qualified to advise whether air or artillery should engage a given target than an artilleryman on the ground? Either he or one of his forward observers certainly has the target under direct observation.

Upon the arrival of fighter aircraft, who could better describe the target? The artillery liaison officer and the forward observers are certainly trained observers. The liaison officer must inform his fire direction center when to lift fires prior to the actual strike and he must be aware of every detail connected with the strike itself and with its co-ordination. He and his forward observers are frequently called

upon to adjust marking artillery fires on targets to be attacked under the present system and, therefore, the artilleryman on the ground should control the strike. The regimental commander could be kept informed by his artillery liaison officer who is always present within the command post.

A COMPARISON OF SYSTEMS

Let us compare the presently approved system with the one that is recommended. Analysis determined that the ingredients of any successful control system are *communications*, a *knowledge of techniques* involved, and a *knowledge of the situation*. Communications within a control system are basically a collection of material items of equipment.

The intangible is the personnel who operate the equipment. The branch of service of the personnel has nothing to do with its operation. Their training is important, but who conducts it has little to do with the net results obtained. The equipment itself must be capable of producing the results desired. The branch of service that develops it again does not enter into the results obtained. It is reasonable to assume, then, that the results may well be the same regardless of who is operating the communications equipment, providing adequate training and equipment have been provided. The pilot assigned as the forward air controller is an expert in flying aircraft. He is, in addition, familiar with the capabilities of aircraft armament and the most effective method of placing it on the target. He is aware of the necessary elements of a successful air strike such as wind, weather, and altitude. Past this point he has stepped from his medium.

The artilleryman knows the effects of fires upon ground targets, he is intimately aware of the needs of ground troops, he knows exactly where the ground troops are located, or can quickly find out, and he knows where this supporting arm fits in with all the others being employed. True, he knows nothing of the technical characteristics of the aircraft, or of its operation. Is it necessary that the ground controller be a technician? Can we afford to employ a technician as forward air controller? We must answer this question in the affirmative or we will disagree with the present system.

Present doctrine dictates that only an experienced fighter pilot can be a forward air controller. In Korea today it is impossible to provide adequate personnel to meet the requirements of one TACP for each battalion. In view of that, how can we propose to meet the requirements for 60 or 70 divisions in the field under full war conditions? This is not good business from the Air Force point of view. Forward controller duty is not the place to rejuvenate the war-weary pilot.

The Artilleryman's Qualifications

Let us now consider whether the recommended artilleryman can properly perform the duties adequately. He is a qualified ground observer, and many are also qualified air observers by virtue of acting as observers in light aircraft. This artilleryman is an accepted member of the ground force family. He is not rotated after a few weeks and replaced by a new member of the team, as is the Air Force pilot. Each new pilot observer must be made familiar with the requirements. The artillerymen are not completely qualified, however, for they are not familiar with over-all aircraft capabilities and their armaments. This would require a little additional education, however, it appears that it would take less training to train the artilleryman to be a forward air controller than it would to train the Air Force man, first, to be a pilot and, second, to be a forward air controller.

Knowledge of the Situation

Knowledge of the situation is necessary to provide the control system we desire.

To assure accurate artillery fire and reasonable safety for advancing ground troops, an observer must be able to see the target and communicate with the unit controlling the weapon. Above, an *L-19 Bird Dog* flying an observation mission in Korea. Below, infantry advancing in Korea after an artillery preparation.—Department of Defense photos.

Once ground units are in contact, the existent situation is normally merely a variation of the usual theme. To the ground force man, the situation weaves itself into his background of training and prior experience and it does not strike an unfamiliar chord. To the Air Force pilot, however, each situation is foreign until he has been an observer for an extended period. By the time he is a qualified observer, much of his skill as a pilot has been lost through a lack of practice. A far more detailed knowledge of the situation and of the actions to be taken to meet current problems will be more readily available to the artilleryman.

Basic Factors

Basically, the factors that require detailed consideration are: First, *is it necessary to have an experienced fighter pilot serve as the forward air controller;* and, second, *can we afford, during an all-out war, to employ such highly skilled personnel in the numbers required?* It is believed that the answer to both of these questions is negative. Let us not, in the interests of manpower economy, assume that the proper answer to it all is to reduce the number of TACPs so as to provide only one for each infantry regiment. That will never prove satisfactory.

The Air Force cannot afford, in an all-out war, to provide adequate numbers of highly skilled fighter pilots to act as forward air controllers with each infantry battalion. It is, frankly, not profitable business. It is not the proper place to utilize the war-weary pilot for he will not recuperate if he properly performs his ground controller duties. It appears that it is logically the duty of a ground force officer since it is in his medium that the ground controller operates.

This article is a plea to provide adequate personnel and equipment to permit the commander on the ground a voice in exactly where and how the aircraft strike. It is not a plea by the ground commander to have his own personal flight of planes to support him at his call, nor an attempt by the ground commander to usurp the rights of command and control of tactical air support.

Events in Korea have focused attention on two important Air Force missions—air support of ground forces and air transportation. Because our planes have thus far kept down practically all enemy air opposition, we have been able to devote a high proportion of our total airlift, and a large segment of our combat air strength, to the support of our ground troops on the Korean Peninsula.

General Nathan Twining

The Allied Command, Atlantic

Lieutenant Colonel Robert C. Williams, Jr., *General Staff Corps*
Assistant Director, Home Territories and Island Bases, Plans Division, SACLANT

THE naval defense of the Atlantic Ocean, from the North Pole to the Tropic of Cancer and from the Western Hemisphere to the continent of Europe, is of vital importance to the North Atlantic Treaty Organization (NATO). The appointment of Admiral Lynde D. McCormick, United States Navy, as Supreme Allied Commander, Atlantic (SACLANT), on 30 January 1952 was another step in the activation of the command structure of NATO. The first such step, of course, was the appointment of General of the Army Dwight D. Eisenhower as Supreme Allied Commander, Europe (SACEUR).

However, even though the SACLANT appointment was given much national publicity, in the newspapers and magazines of all the NATO nations, primarily because of the continued opposition to it by Prime Minister Churchill, the reasons for a SACLANT, his mission, relationship with other NATO and national commands, his command organization, tasks, and problems are not so universally known.

Background

It might be well, therefore, to look into the NATO background and examine the points mentioned above in order that a clear understanding may be gained as to the importance of this relatively new NATO command.

Article 6 of the North Atlantic Treaty states ". . . an armed attack on one or more of the Parties is deemed to include an armed attack on the territory of any of the Parties in Europe or North America, on the Algerian Departments of France, on the occupation forces of any Party in Europe, on the islands under the jurisdiction of any Party in the North Atlantic area north of the Tropic of Cancer, or on the vessels or aircraft in this area of any of the Parties."

Geographical Basis

The area of responsibility defined above was first divided into regions, and regional planning groups were established to prepare plans on a geographic basis for the defense of their areas, and to cooperate with one another to eliminate conflict in, and ensure harmony among, the various regional plans (see Figure 1). The present NATO military command organization has resulted from the further development of the combined efforts of the NATO nations to improve the arrangements for their collective security, and with the exception of the Canada-United States Regional Planning Group, the regional groups have "phased out" into the currently established NATO commands. (See Figure 2.)

The North Atlantic Council, at its sixth

The objective of NATO strategy is survival—it is SACLANT's responsibility to co-ordinate the naval forces of all NATO nations into an organization that can effectively maintain control of the high seas

session on 18-19 December 1950, completed arrangements for the establishment of an integrated force for the defense of Western Europe under centralized control and command, and appointed General Eisenhower to serve as Supreme Allied Commander, Europe.

At the eighth session of the council in Rome on 24-28 November 1951, approval

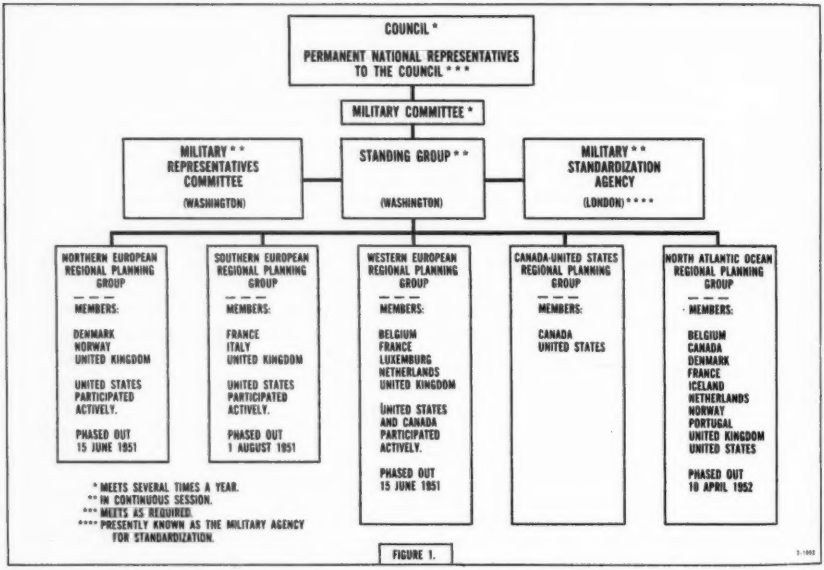


FIGURE 1.

was given for the establishment of the Channel Command as well as to the terms of reference (with a United Kingdom reservation) for the Supreme Allied Commander, Atlantic. A United Kingdom reservation pertaining to these terms of reference were subsequently withdrawn and Admiral Lynde D. McCormick was appointed to this post on 30 January 1952. This appointment was in furtherance of the NATO strategy.

North Atlantic Treaty Organization collective strategy is based on several fundamental principles: Western Europe, the strategic pivot of the world, can be defended; each ally, in the event of aggression, would perform the job best suited to its geographical position and military capability; and the mass superiority of the aggressor must be matched by technological superiority by the allies.

The objective of NATO strategy is survival. German cities bear witness to the destruction of war as do Hiroshima and Nagasaki. All nations appreciate this and the Soviets are no exception.

Survival, however, is not an automatic process. Peace can be secured only by hard work and continued daily toil by the political and military leaders.

Sufficient NATO forces, equipment, and money just do not exist to protect all NATO interests. Therefore, NATO strategy, of necessity, had to include a determination of the most vital interests. Subsequently, plans had to be drawn up for the employment of the NATO war potential which would ensure that such employment would be the most advantageous

in the defense of the selected vital interests. Based on this, NATO strategic interests have been oriented primarily in the direction of the North Atlantic Ocean, Europe, and the polar cap.

SACEUR—SACLANT Areas

It will be recalled that the SACEUR's area of responsibility includes Norway, Denmark, the Benelux countries, France, Western Germany, Italy, Greece, and Turkey. He is responsible for the coastal areas of such of these countries as border on the Atlantic and the North Sea (exclusive of the area assigned the Channel Command), as well as the Mediterranean Sea, including the coastal areas of those NATO nations bordering thereon.

SACLANT's command, on the other hand, extends from the North Pole to the Tropic of Cancer (latitude 23 degrees, 27 minutes North) and from Western Hemisphere shores to the coastal waters of the British Isles and the continent of Europe. (See Figure 3.) It includes Greenland, Iceland, Jan Mayen, Spitsbergen, the Azores, Madeira, Bermuda, and the Faeroes. However, the control and defense of zones of the interior and the coastal waters of sovereign nations in and/or bordering on SACLANT's area are the direct responsibility of the nation concerned who will provide (through agreement, of course) the facilities required by SACLANT. Thus, the United Kingdom is not in the SACLANT area—in fact, the United Kingdom and continental Portugal are the only two countries in NATO whose territories are not in any command (SACLANT or SACEUR) or regional groups (Canada-United States Regional Planning Group).

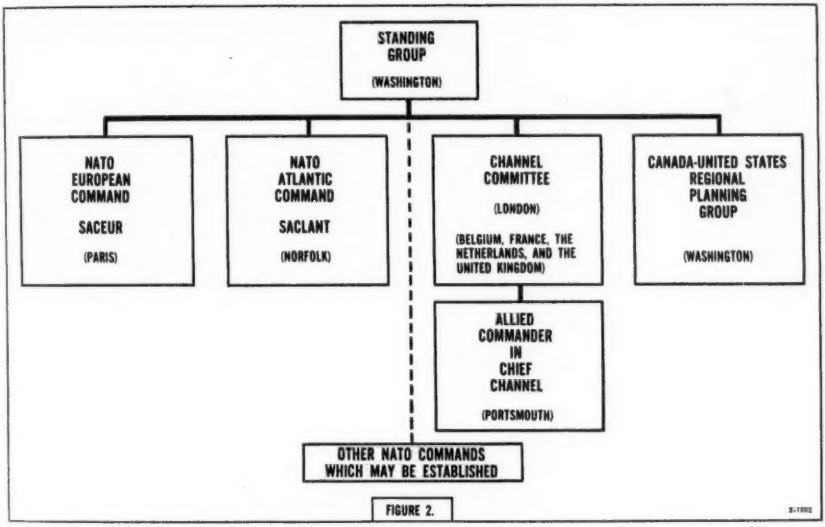


FIGURE 2.

Co-equality

SACLANT and SACEUR are co-equal (and mutually supporting) commands of NATO. Both report to a common superior, the Standing Group. The latter, composed of military representatives of the United States, the United Kingdom, and France, is the executive agency of the Military Representatives Committee upon which all NATO nations are represented.

Today, Admiral McCormick has been charged by the Standing Group with the following:

1. Developing war plans.
2. Conducting joint and combined training exercises.
3. Advising NATO of logistical requirements.
4. Being concerned with the entire command's state of readiness, its training standards, and the establishment of units.
5. Maintaining direct communication with the national chiefs of staffs, defense ministers, and heads of governments to facilitate the accomplishment of his mission.

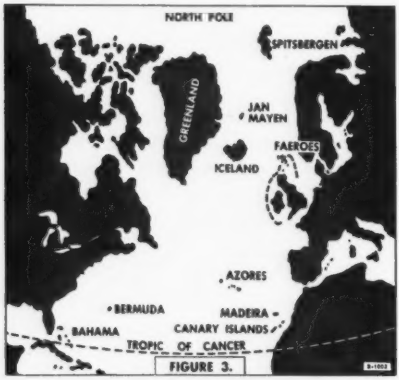


FIGURE 3.

In the event of war, SACLANT's authority would be broadened under the Standing Group directive to empower him to:

1. Conduct and direct over-all operations.
2. Determine policy.
3. Assign forces.

Admiral McCormick's first official act, after assuming command, was to announce the selection of his principal subordinate commanders. He then proceeded to organize his staff.

In connection with the SACLANT staff, it should be noted that Admiral McCormick is a veteran submariner and an authority on antisubmarine tactics. His chief of staff; assistant chief of staff for plans, policy, and operations; director for operations; and assistant director for offensive operations are all naval aviators. Hence, when one considers the threat to the SACLANT area—300 to 400 undersea boats, including modern high-speed snorkel craft, plus that of land based aviation patrolling the eastern reaches of the area—one can understand how SACLANT intends to keep the North Atlantic sea lanes open for the flood of men and supplies needed in the event of open conflict and to support SACEUR in every other possible way.

SACLANT Staff

Actually, the original concept of the SACLANT staff did not embody the normal general and special staff organization. The communications planners, for example, were to be in C3 and the rest of communications in C1. Similarly, the budget and fiscal planners were originally to be part of C4 and the remainder of the section in C1. The PIO was slated to be under C1.

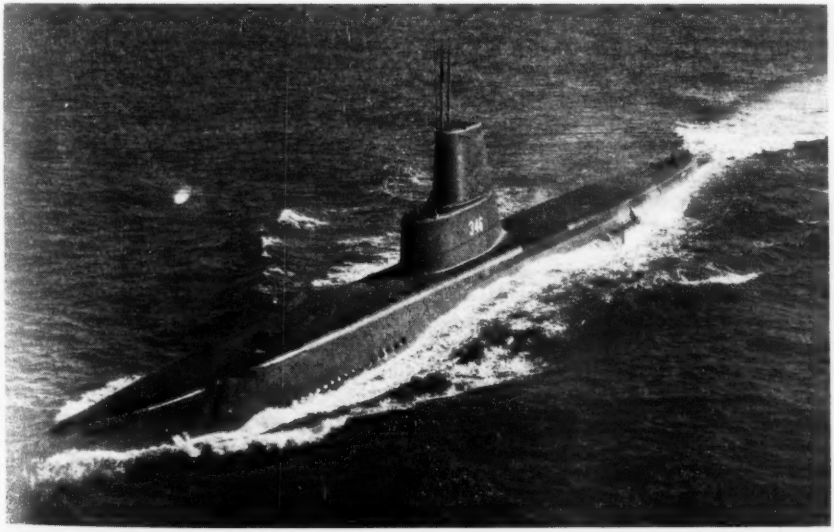
However, the magnitude of the communications planning problems alone soon made it evident that a separate division would be necessary. The extremely complicated budget and fiscal problems facing an international staff also indicated a pressing need for an enlarged and separate division.

An important section of the SACLANT staff is that of Strategic Application and Policy. This section has general staff cognizance of all matters dealing with policy, policy application, organization and command relationships, and plans co-ordination.

Another section of equal importance is that of Politico-Military Affairs, charged with cognizance of matters connected with the integration of political considerations and military plans and operations.

The SACLANT staff, as well as the

A potent force available to SACLANT will be the submarine and antisubmarine force. Above, speedy new type motor torpedo boats will participate in SACLANT's hunter-killer operations. Below, fleet type submarines, streamlined to increase underwater speed, will carry out SACLANT's offensive patrols.—Department of Defense photos.



subordinate staffs, represents an efficient organizational nucleus capable of wartime expansion.

SACLANT Forces

To carry out his mission, SACLANT will command all types of fighting ships allocated by the North Atlantic Treaty nations for this purpose. In addition, he will command all the ground and air forces which defend his bases (such as those United States units currently in Iceland), just as General Ridgway has allied army, navy, and air units under him at SHAPE.

However, one marked difference between the SACLANT and SACEUR structures lies in the fact that no major forces are actually committed to the SACLANT command in peacetime, except for limited periods for combined maneuvers. Forces will be earmarked for his command in an emergency and SACLANT will make recommendations to the member nations as to the steps to be taken dealing with their readiness for war.

Actually, SACLANT will have operational command of the United States Atlantic Fleet (less that portion allocated to SACEUR in the Mediterranean) to the extent necessary for the accomplishment of his mission, and this force alone is of considerable strength.

Planning for and directing existing forces, determining probable missions, and training such forces for the execution of these missions is a large order. It calls for a knowledge of possible requirements as well as of existing capabilities. It requires setting up common standards and training all existing forces to meet those standards for co-ordination of all related activities by the forces of those in command.

New Threats

The Chief of Naval Operations has warned the United States that the submarine threat in the Atlantic will be much worse than the German undersea threat in World War II. His warning, he said, was based partly on reports that the Soviets are nearing the day when they will be able to divert three-quarters of their submarines into the Atlantic without having to run them through the Baltic or Black Seas. He pointed out that the Soviets are completing a system of canals and waterways to transport their Black Sea and Baltic fleets northward to Murmansk.

There are also the very serious threats from mines, surface raiders, and aircraft.

To meet these threats and to control the sea, protect the sea and air lines of communication, defend the bases, deny the use of the sea to the enemy, support SACEUR and other NATO and national commands, and to be prepared to undertake offensive operations, SACLANT must, in peacetime, ready his forces so that they will be able to carry out their tasks efficiently in wartime.

Some of these will involve the control and routing of shipping; offensive carrier operations; possible amphibious operations; submarine operations; base defense; offensive and defensive mine warfare; search, reconnaissance, and rescue operations; evacuation; and meteorological tasks.

Carrier Task Forces

SACLANT carrier task forces will not only be charged with attacks on ports, harbors, and naval and air bases, but they will have to go after the submarine bases and supporting facilities. They will also play a big part in supporting SACEUR's northern flank. Bombing; offensive mining of harbors, port entrances, and canals; attacks against surface forces, including raiders; air support of the land battle as well as air support of amphibious operations; diversionary attacks; and the augmentation of, as well as support of, the strategic air offensive—all these are jobs for the carrier task forces. These powerful striking forces, consisting of

fleet carrier task forces, amphibious forces, submarines, battleships, cruisers, destroyers, minesweepers, and mobile support groups, will bring the war to the enemy homeland.

SACLANT will also conduct hunter-killer operations, using light aircraft carriers and their antisubmarine warfare escorts and special aircraft to find and destroy enemy submarines in their concentration and transit areas. This type of operation will hamper enemy submarine movement and will reduce their effectiveness.

Submarine Force

A third equally potent force available to SACLANT will be the submarine force. Not only can this force carry out offensive patrols outside enemy harbors, mine enemy port approaches, and combat enemy submarines, but it also can attack enemy ships and naval surface forces, execute reconnaissance missions, perform radar picket duties, and even transport and land commando-type units.

Surface Force Problems

Aside from offensive mining by maritime and fleet air forces and submarines, SACLANT will also have to be prepared for surface force operations. Enemy raiders loose in the Atlantic, a sudden naval break-out from the Baltic, and an enemy invasion of northern Norway—all these possibilities must be considered and plans made to cope with them.

SACLANT must defend, control, and protect the sea and air lines of communication in his area—or the battle for Europe will be lost. This in itself is a gigantic task, for ensuring safe passage for troopships is a comparatively minor problem. The supplies which will have to be transported to the United Kingdom and to Europe—the logistical support—will reach staggering tonnage totals.

Hence, SACLANT will have to control the movement of ships; institute convoy systems when and where required; route and divert ships; deploy air and surface escort forces for the protection of shipping against submarine, air, and surface attack; reduce the scale of enemy minelaying; and counter the effect of mines already laid.

Wartime Mission

In order to carry out his wartime mission, SACLANT today must ensure that the forces made available to him in wartime are organized, equipped, trained, and ready for operations to implement his war plans. Many problems already have arisen in connection with these peacetime tasks.

Admiral McCormick stated, upon assuming command as SACLANT, that it was quite clear to him that much greater effort by all the nations associated with the Allied Command, Atlantic, must be applied to build up the forces which are required to maintain control of the high seas and the coastal waters which concern the command. His present level of forces, he said, introduces risks which are unacceptable. Even the increased maritime forces which have appeared in NATO planning will fall short of those necessary to give Europe and the allied European command the direct and indirect support which Admiral McCormick envisages they will require from him. He stressed the point that the *tasks* of his command are by no means directly proportional to the size of the navies of potential enemies.

Problems

The problems which beset this new command were many and immediate.

Standard tactical operating procedures have to be established if real allied teamwork is to be assured. Common SACLANT doctrine—in antisubmarine warfare, for example—will have to be developed. Combined schools, frequent combined maneuvers, and an increasing exchange of information and doctrine will assist materially in solving this problem.

Similar obstacles appeared in the fields of organization and administration. Com-

mon supply methods, equipment, and replacement procedures must be the goal here. Standard communication procedures and codes, for example, are of particular importance to this predominantly naval command, and in this matter the language barrier complicates the already knotty problems that stem from differences in procedure and equipment.

Also, if military plans and orders are to be readily understood by all the national groups involved, some uniformity in the form and method of expressing military ideas must be devised. Formats for plans and orders, the meaning of military terms and symbols, and tools of administration (tables of organization and equipment)—all these must be made standard, or at least adjusted, so as to eliminate any possibility of being misunderstood. Of course, all these changes cannot be made overnight. Gradual progress is most desirable in order to ensure solid progress.

Base Development

Infrastructure and base development (which involves base agreements between national governments in some cases), supporting requirements for other NATO and national commanders (Strategic Air Command, for example), national restrictions against stationing foreign troops in one's own territory, firm command boundaries, and methods of obtaining national intelligence for tabling in NATO—all these are not easily solved, yet must be considered by SACLANT.

SACLANT's Staff Requirement

However, much progress already has been made by the new NATO command. Part of this success may be attributed to SACLANT's requirement that his staff officers be more than competent military specialists. SACLANT desired officers whose general qualities of character and attitude were such as to inspire confidence and mutual respect in order that the purely military side of their duties would have maximum results in terms of the larger mission. This insistence upon a truly international staff in itself promotes harmony.

With this type of leadership and the inculcated desire to "get on with the job," the Allied Command, Atlantic, will do more than its share in fulfilling the missions assigned it by the North Atlantic Treaty Organization.

The most effective way of overcoming the military disadvantage of being the nonaggressor—even though we recognize it as the price we are willing to pay for our democratic way of life—is to make the maximum use of the advantages which our way of life have given us.

Major General E. F. Bullene

Why Japan's Antisubmarine Warfare Failed

Atsushi Oi
Former Captain, Imperial Japanese Navy

This article is reprinted from the UNITED STATES NAVAL INSTITUTE PROCEEDINGS, June 1952, by permission of the United States Naval Institute, Annapolis, Maryland.

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

RECENTLY I had an opportunity to read American literature on the antisubmarine warfare which the Japanese Navy waged during the Pacific war. Among them are included some chapters in the *United States Submarine Operations in World War II* by Theodore Roscoe, and *The War Against Japanese Transportation 1941-1945* by the Transportation Division of the United States Strategic Bombing Survey. I, as a former staff officer of the Japanese Grand Escort Command Headquarters, feel it my duty to explain what I know about the subject, so that the study may be made more complete. I take up this task particularly because the Pacific war records thus far compiled by the Japanese have said very little on the subject.

In a nutshell, Japan failed in antisubmarine warfare largely because her Navy disregarded the importance of the problem.

PREWAR BACKGROUND

Being at first a disciple of the British Navy, the Japanese Navy should have been more conscious of the importance of shipping protection. However, by the beginning of this century, she had established her own traditions on the basis of the proud lessons learned in the First Chino-Japanese War of 1894-95 and the Russo-Japanese War of 1904-05. In the tradition-making era, Japan was still an agricultural state with little population pressure. Her sea-borne trade was not vital. Most of the naval lessons were learned from the Battle of the Yalu, the Battle of Tsushima, and the other fleet-versus-fleet actions. True, there were some incidents where a troop ship was attacked and sunk. However, the reflection of such incidents was overshadowed by the brilliant successes of many fleet actions.

World War I did little to add to the traditions of the Japanese Navy. During the war, Japan became industrialized and dependent more and more upon the sea-borne trade. She sent many destroyers to

Japan's overestimation of fleet combat and her indifference to antisubmarine warfare and the protection of her sea-borne trade brought about the loss of shipping which eventually contributed to her defeat

the European waters to help the British Navy in the fight against U-boats. However, in studying the war, the Japanese naval students, already imbued with the tradition of the Battle of Tsushima, liked to discuss the fleet engagements off Coronel, the Falkland Islands, and Jutland. Though some historians at the Naval War College lectured on the antisubmarine warfare of the British Navy, they failed to arouse the interest of the pupils. Outside the Naval War College, the study of commerce protection carried little weight.

Racial Temperament

Perhaps, at the bottom of our naval tradition, there was a problem of racial temperament. Compared with the Europeans the Japanese are generally said to be more impetuous and less tenacious. They preferred colorful and offensive fighting to monotonous and defensive warfare. It was only natural that convoy escorting and antisubmarine warfare were not jobs which were welcomed by the Japanese naval men.

National Policy

The more immediate reason for the neglect of the trade protection problem can be traced to the naval policy, or rather the national policy. As soon as the Russo-Japanese War of 1904-05 was over, the Japanese-American relations underwent an abrupt change. In 1909, the national defense policy of Japan was formulated. Up to that time Japan thought, traditionally, that China and Russia were the most probable enemies. At this time, the United States was added to the long-standing list of the probable enemies. The Japanese leaders predicted that the Japanese position in the Far East would conflict with the westward expansion of the United States.

Again, in 1922, as a result of the Washington Naval Armament Treaty and the Nine-Power Treaty, the national defense policy was revised. Needless to say, Japan came to place more and more emphasis upon the United States as the probable enemy.

National Resources and the Army

However, Japan's national resources were miserably inferior to those of the United States. Moreover, since Russia and China were retained as probable enemies, Japan appropriated a large amount of money for the Army, thus limiting the budget of the Navy, which had to bear the main burden of dealing with the United States. With a small means, the Navy could not help concentrating its armament on one single purpose, the building and maintaining of a first-line fleet strong enough to meet the American antagonist which was expected to come across the Pacific.

Inaccurate Estimate

Our Navy also estimated that the United States Navy had no intention to wage any extensive warfare against merchant marines. The Japanese Navy took it for granted that the role to be played by American submarines would be quite the same as that of her own submarine forces, and slighted the role as commerce raiders.

Naval Building Race

In the 1930s, the naval building race was resumed. To compete with the mighty United States in the building of the first-line fleet, it became more and more difficult for the Japanese Navy to divert its poor resources to the building of antisubmarine forces. Moreover, judging from the American naval building program, the Japanese Navy became fairly well convinced that the American Navy would seek a decisive fleet action as soon as possible.

Meanwhile, the progress of the economic exploitation in Manchuria and northern China begot a deceptive notion that the island empire was becoming a continental

power with less dependence upon seaborne trade.

European Influence

After the latter part of the 1930s, the British Commonwealth was added to the probable-enemy list along with the United States.

Encouraged by Hitler's successive victories in Europe, the pro-Nazi expansionists clamored for the seizure of the oil-rich southern resources area. Singularly enough, however, the problem of sea communications between the southern resources area and Japan was treated rather carelessly.

ANTISUBMARINE PREPARATION

Japan's failure in antisubmarine warfare during the Pacific war had certainly been long foredestined. Further, the singular underestimation of the submarine menace helped the Japanese leaders in casting the die. Then, what underestimation was made in the decision of war or peace?

The preparations for the prevention of submarine losses were alarmingly neglected. All strategic policies and operational organizations of the Navy at the top level were decided in the operations division of the Naval General Staff. The operations division was divided into two sections: the first section of about 10 officers, all chiefly dealing with the combined fleet operations; and the second section of 3 or 4 members, each separately in charge of miscellaneous duties including naval regulations, training, and rear-line defense.

Rear-Line Category

The duty of shipping protection and the antisubmarine warfare was included within the category of the rear-line defense of the second section. Before the fall of 1941, only one officer was assigned in the section for the entire duty of rear-line defense. With war imminent, the rear-line defense duty became the care of two officers: one for mining and antiaircraft defense and the other for protection of shipping. Herein is reflected the comparative weight which the Naval General Staff gave to shipping protection warfare as compared with the combined fleet operations.

In the operational forces, too, this duty was relegated to an obscure position. The forces to take charge of shipping protection were the major and minor naval stations: the Yokosuka, Kure, Sasebo, and Maizuru Naval Stations and the Ominato, Osaka, Chinkai, Ryojun (soon to be abolished), and Bako (later to be transferred to Takao) Minor Naval Stations.

In these naval stations, from high ranking admirals down to the seaman, the notion was firmly seated that the major duty of the stations was to offer every possible service and accommodation to the combined fleet. The importance these stations attached to the protection of shipping may well be judged by the fact that the duty was attended rather half-heartedly in the station headquarters. For instance, in the headquarters of the Yokosuka Naval Station, whose area of responsibility included the sea lanes along almost the entire eastern and southern coast of Honshu (600 miles) and that from Tokyo Bay down to Iwo Jima (700 miles), there was only one officer who attended shipping protection. This officer was called "Staff Officer for Education," as he was mainly designated to the administration of various educational institutions. The remaining staff officers, numbering more than five, were largely indifferent to shipping protection. The same was true with the other naval stations.

Convoy Procedure—1941

As of 8 December 1941, there was no unit whose exclusive mission it was to provide protection for merchant ships. Such a mission was concurrently carried

out by the forces engaging in sea patrol. As to troop transports, the escort was provided by units of the combined fleet as occasion demanded. No convoy was organized in the case of nonmilitary shipping.

Civil-controlled ships were encouraged to sail independently in order to secure the highest possible shipping circulation. Some regulations prepared for emergency were laid down to control the sailing of merchant ships. Issued by each local naval commander, these regulations varied from one area to another, with resultant great confusion to ships' masters. It was not until the fall of 1942 that these regulations were unified in the form of a directive by the Naval General Staff, entitled "The Doctrines Concerning the Protection of Sea Communications During the Greater East Asia War."

Little effort was made to follow the example as admirably displayed by the allied antisubmarine forces in 1917. Such an indifference on the part of the top strategists would produce a far-reaching effect.

Mahan's Lesson Ignored

The American Navy men, who are close students of Mahan, may have doubts whether the Japanese strategists gave a moment's consideration to Mahan's lesson that only the nation which can both trade and fight will win a major war. These doubts are deepened more and more as we study the strategy the Japanese Naval General Staff followed during the entire course of the war.

INITIAL BLUNDER

As of 8 December 1941, Japanese merchant vessels were distributed as follows:

Army control	2,160,500 gross tons
Navy control	1,740,200 gross tons
Civil control	2,436,300 gross tons
Total	6,337,000 gross tons

The president of the Economic Planning Board demanded that at least 3 million gross tons would have to be retained constantly for civil use. This was made impossible at the outset of the war because of the extra shipping demands by the Army and Navy.

The First Phase

In acquiescing to the military demand, the Government obtained the Japanese High Command's pledge that, of the military tonnage, 1,100,000 gross tons would be returned to civil control after April 1942, the expected date of the completion of the first phase of the war. By the first phase, it was meant that the southern resource area, including the Dutch East Indies, Malaya, the Philippines, and Hong Kong, would have been occupied. During this phase, it was also expected that New Britain as well as Wake Island and Guam would have been taken.

The Objectives

The invasion objectives first aimed at for the first phase were achieved much easier than expected, except for a hitch at Bataan. The Japanese Army High Command had a plan to return as many troops as possible to the homeland and Manchuria as soon as the first phase of the war was over. The Army intended to attack Russia whenever a good opportunity was created by German military success in the West. The Army also wanted to exert more military pressure against Chungking.

The Navy, on the other hand, was firmly convinced that Japan had to concentrate all her efforts on the present enemies in the Pacific front, diverting no more forces to the Continent. The Navy thought that it would be suicidal to cause a new war with Russia at the time when Japan's hands were more than full. It seems the differences of opinion on this most fundamental question between the Army and the Navy were left com-

pletely unadjusted well into the middle stage of the Pacific war.

Success and Ambition

For the present, however, elated with an easy success in the first stage, the military with the Navy taking the lead improvised a more aggressive plan to extend the area of occupation. As soon as the sweep of the Indian Ocean was over in April 1942, the carrier task forces were ordered to prepare in haste for the next offensives.

In May, operations were launched with a view to occupying Port Moresby in the south and to capturing the Aleutians and Midway in the north, at almost the same time. The Japanese High Command seems to have paid little heed to the fact that if the areas of occupations be extended the shipping bottoms had to be diverted so much more from civil use, and that the expanded line of communications would be exposed more and more to enemy attacks, thus inviting greater losses of tonnage.

A More Aggressive Plan

It is almost ridiculous from our postwar judgment, but it was a fact that a far more aggressive program than was actually put into execution was placed on the council table of the High Command in the spring and summer of 1942.

First of all, the Navy proposed that the Hawaiian Islands be captured. The Army was opposed to the plan with shortage of troops as its reason. Instead, the Army considered occupying the Aleutians, the Fijis, the Samoas, the New Caledonias, eastern New Guinea, the Cocos Islands, the eastern part of India, and Ceylon.

The Navy insisted on the occupation of Australia, which was also turned down by the Army because of the logistic difficulties as well as the shortage of troops. Hot discussions ensued and it was finally agreed that the new areas to be occupied would include the New Caledonias, the Fijis, the Samoas, the Aleutians, and Papua (including Port Moresby). If all of these far-flung occupations had been attempted, the deterioration of the Japanese shipping situation would have been incalculably faster and greater than it actually occurred.

The reason why the Navy was more aggressive than the Army in the plan of extensive occupation was threefold. First of all, the Navy had less trouble in the maintenance of the logistic support of its own forces, because the naval vessels could carry on board their own provisions and ammunition for many weeks. Thus, the naval forces could maneuver independent of supply lines. Moreover, in case of adversity they could retreat as they saw fit.

In the second place, the Navy strategists foresaw from the very first that the war would be lost if prolonged. It was only natural that they were anxious to seek a decisive battle as soon as possible. To do so, they had to create an opportunity even at some risk. Under the prevailing circumstances, the American fleet would not come out if the Japanese fleet just assumed a wait-and-see attitude.

In the third place, the Navy wanted to draw the Army's attention more to the Pacific lest the Army should commit itself to the Asiatic Continent.

The Second Phase

Earlier than calculated from the Pearl Harbor success, the second phase aggressions in the Pacific were met by strong enemy counterattacks. In addition to the great adversities at Midway and on the Coral Sea, the airfield construction on Guadalcanal by a small naval unit gave birth to a disaster of the first magnitude. The bloody half-year struggle started for the control of this strategic island.

This proved to be the first instance where Japan incurred a major shipping

sacrifice. Before this scramble started, some portion of these bottoms were gradually being returned to civil use by the military. As the result of the Guadalcanal struggle, however, many first-rate merchant vessels had to be again diverted to military use.

As of the beginning of August 1942, the distribution of the shipping bottoms was as follows:

Army control . . .	1,382,900 gross tons
Navy control	1,771,500 gross tons
Civil control	3,112,400 gross tons
Total	6,266,800 gross tons

That was nearly the best controlled shipping in the entire course of the war. However, the Guadalcanal operation cost very highly to the military bottoms, which had to sail in the waters not very far from hostile submarine bases as well as in close proximity to enemy air bases. As a result, by the beginning of January 1943, the shipping distribution was changed as follows:

Army control	1,623,400 gross tons
Navy control	1,814,000 gross tons
Civil control	2,629,300 gross tons
Total	6,066,700 gross tons

The prewar plan to secure 3 million gross tons for civil control was thus shattered, and was not to be recovered for the duration of the war.

Half-Hearted Antisubmarine Measures

In the meantime, the interior regions were left almost entirely undefended. In some instances, what little had been installed for the defense of interior regions was dismantled to be transferred to fortify newly occupied frontier positions. Equipment which should have been for antisubmarine purposes in rear lines, such as mines, was not excepted. In shipbuilding, a similar thing took place, and the construction of antisubmarine craft was deferred. In peacetime, no antisubmarine craft were built, in the expectation that they could be easily and quickly built after a war was actually declared. In 1941, when the construction of four frigates was first approved, these craft were intended to be used not as escort vessels but for coastal defense or fishery protection. Therefore, they were called "Kaibo-kan" (coast defense ship).

Although frigates were later used almost exclusively as ocean-going escorts in the face of the acute antisubmarine problem, it was not until June 1943 that the building of 40 ships of this type was approved. And this belated approval does not seem to have been a willing one, judging from the fact that the antisubmarine branch requested to have 360 of them built. Meanwhile, the building priority was given to aircraft carriers, submarines, and high-speed Navy transports.

Belated Birth of Escort Groups

Until 10 April 1942, the Japanese Navy had no unit whose duty it was to escort merchant vessels. On that date, two escort groups were activated: the First Escort Group which consisted of 10 old destroyers, 2 torpedo boats, and 5 converted gunboats to escort merchant vessels sailing the 2,500-mile sea lanes between Singapore and the Japanese homeland (usually Moji); and the Second Escort Group which consisted of 4 old destroyers, 2 torpedo boats, and 1 converted gunboat to take care of the military supply line between Yokosuka and Truk. One glance is enough to conclude that the forces were far from adequate.

Even the belated birth of these two escort groups was made possible only with a grudging consent. The officer at the Naval General Staff who insisted on the subject was temporarily transferred to the headquarters of the new First Escort Group, leaving vacant his post in Tokyo for about 6 months. As for the head-

The Imperial Japanese Navy preferred offensive fighting instead of defensive warfare. Convoy escorting and antisubmarine warfare were jobs which were not welcomed by Japanese naval men. These two photographs, taken through submarine periscopes, show the results of United States torpedo attacks during the war.—Department of Defense photos.

quarters of the Second Escort Group, the personnel of the Fourth Base Force (with headquarters at Truk) was concurrently posted. During the entire period of the Pacific war, the weakest point in the naval preparedness lay in the scarcity of personnel whose experiences were deemed qualified for staff duties. In other words, the Japanese Navy was miserably lacking in the number of Naval Academy graduates of commander and lieutenant commander grades.

Faulty American Torpedoes

Luckily, however, for the Japanese merchant vessels, some of the American submarine torpedoes proved to be ineffective. Frequently ships' masters saw premature explosion of enemy torpedoes. Some merchant vessels entered port with unexploded American torpedoes thrust into the hull. A saying became fairly current that a tanker would not sink if torpedoed. Such being the case, the masters of merchant vessels preferred not to be bothered with convoy-sailing. The shipping authorities wanted to see their ships allowed to sail independently because sailing in convoy would mean a reduction of efficiency of shipping circulation.

Lost Opportunity

Postwar wisdom tells us that Japan should have reformed and strengthened her antisubmarine organization during these comparatively quiet months. Taking advantage of the God-given quietude, she ought to have made up for the prewar negligence in the antisubmarine preparedness. However, this long period of quietude seemed to have ultimately worked against Japan. The Americans built more submarines, trained submarine crews, and, of course, did everything to rectify the torpedo situation. Japan was lured to extend the lines of operations, exposing more and more her precious shipping to enemy attacks. And nothing drastic was done to remedy antisubmarine unpreparedness.

Besides those already mentioned, the only appreciable betterment in this direction was initiated on 10 October 1942 when an independent division was created within the Naval General Staff to take charge of the shipping protection and other rear-line defense.

The new division was designated as the Twelfth Division of the First Bureau. A captain headed the division with three members as direct subordinates: a commander who headed homeland defense, a lieutenant commander who headed convoy and routing as well as antisubmarine activities in general, and the third, also a lieutenant commander, who directed the armament and signal equipment of merchant vessels.

The Awakening

If I remember correctly it was about 20 August 1943 that we first realized that some innovation had come to the American submarine torpedoes. The sinking rate of torpedoed ships began suddenly to climb. Furthermore, since the previous spring, the shipping losses in general had reached a higher level than ever before—far exceeding the 70,000-gross tons level a month which the Navy strategists had predicted in their prewar calculations.

In the last days of August 1943, the military at last began to doubt Japan's ability to check the predicted allied onslaught at the Rabaul area, where, after the withdrawal from Guadalcanal, the Army and Navy had built up a fortified zone with a plan to stage a decisive resistance. The Army had always been more willing than the Navy to contract the Pacific front. This time, too, it was the Army which first proposed to pull back the first line of defense to the area linking the Marianas, the Carolines, and western New Guinea.

Increases Requested

The High Command requested that a large amount of civil-controlled tonnage (I think it was about 300,000 gross tons) be additionally transferred to Army and Navy control, and that the production rate of aircraft be boosted up to the level of 55,000 planes a year.

The Government could not honor these requests. The shortage of civil-controlled shipping had had a telling effect upon the economy of the Nation, both in the field of munitions production and in the sustenance of the civil population. In order to raise the aircraft production to the mark of 55,000 a year (the best previous record was 1,470 a month in September 1943), the first essential was to have sufficient shipping bottoms for the importation of raw materials. Heated discussion ensued between the Government and the High Command, with the shipping problem as the center of argument. At last a compromise was reached. It provided, in effect, that 250,000 gross tons of bottoms was to be diverted from civil control to the military, and that the Government would do its best to boost the aircraft production to the mark of 40,000 planes a year.

An Understanding

This compromise was based on the following understandings:

1. The High Command would do its best to reduce the total of disabled merchant tonnage (through sinking and damage) below a million gross tons a year (1944).

2. The High Command would do its best to improve the efficiency of shipping circulation, through having more escort forces readily available, thus making it possible to reduce the time spent in convoy formation.

Both the military and governmental leaders felt that they were now faced with the gravest change in their war-making policy. The Nation was also confronted with a great change of world situations as Italy quit the alliance and the German war fate was open to question. On 30 September 1943, a conference was convened before the Emperor between the leaders of the High Command and the Government. This was the most important Imperial conference held since 1 December 1941. The salient points of the conference were the compromise described above, plus an agreement that the tie with Germany would be continued and that an effort would be made to mediate peace between Germany and Russia. (Note: This stage of the war also marked the first inception of a peace move among elder statesmen, with Admiral Keisuke Okada taking the lead.)

Despite the foregoing solemnized decision, the High Command was very slow to act. No immediate effort was made to strengthen the defense of the Marianas-Carolines-western New Guinea zone. This was because of the shortage of ships and defense materials. Instead, the combined fleet continued to commit itself deeper than ever before to the death struggle in the Rabaul-Solomons area. The same apathetic attitude was maintained regarding shipping protection. The shipping losses in September soared up to a record of 172,082 gross tons. This called for urgent remedial measures, but no such measures were taken during October.

As we have seen, the fundamental weakness of the antisubmarine machinery lay in the fact that it lacked a strong representation at the Naval General Staff level. Every nook and corner within the Naval General Staff was dominated by the influence of the combined fleet. Since almost the entire resources of the Navy had been allocated to the combined fleet, without sacrificing the fleet strength in one way or another no drastic improvement in antisubmarine measures was feasible. It was finally decided that a strong headquarters capable of competing with the

combined fleet headquarters should be established.

Grand Escort Command Headquarters

On 15 November 1943, the Grand Escort Command Headquarters was created to exercise supervision and operational command over all the major and minor naval stations in the matter of shipping protection. The First and Second Escort Groups were placed under the direct command of the new headquarters. Thus, every sea area except those outside the jurisdiction of the combined fleet and the China Seas fleet became the area of responsibility of the Grand Escort Command. In other words, only such local routes as running between Truk and the Marshalls, south of Truk, south of Palau, south of the Philippines, in the Dutch East Indies, west of Singapore, and between Chinese ports were outside the responsibility of the Grand Escort Command Headquarters (GECH). Admiral Koshiro Oikawa was appointed as Commander in Chief of the GECH. He was formerly the Minister of the Navy. He was senior to all admirals in the operational field; and seniority was very important in the Japanese Navy.

Certainly the creation of the GECH was a great stride forward. The unified control of convoy routing and other antisubmarine activities became a reality. However, a closer analysis revealed many shortcomings. To man the headquarters to its full complement took much time.

The Means

Concerning the strength in escort ships, Admiral Oikawa was not happy. As of 15 November 1943, he had under his command less than 50 ships of more than 800 tons including 4 converted gunboats and several destroyers so obsolete as to be incapable of ocean sailing. The best of the escort ships consisted of some 15 destroyers built between 1920 and 1925. Of them, only four composed a destroyer group.

In the list of Admiral Oikawa's forces as of 15 November 1943, we can see four escort carriers and the 901st Naval Air Group. However, all four escort aircraft carriers (CVEs) had to undergo repairs at the Navy yards. It was not until July 1944 that the first of them joined a convoy and one of them never joined. The use of these CVEs was only experimental. To use the CVEs, it was necessary for the GECH to teach green fliers how to take off and land on a carrier. These fliers were forced to join a convoy mission before sufficiently trained. This resulted in numerous accidents to aircraft. Moreover, as soon as they finished the first convoy trip, most of them were transferred to combined fleet carriers. We at the GECH felt very sorry to see the CVEs used not for antisubmarine warfare but rather as if they were training carriers. It was no wonder the convoys escorted by the CVEs met no luckier fate than others, and that the CVEs themselves fell victim to enemy submarines.

The 901st Naval Air Group

As for the 901st Naval Air Group, its initial condition was equally deplorable. In Japan there had been no airmen especially trained for antisubmarine warfare. The group was the first air unit created for the exclusive purpose of antisubmarine warfare. Nor had there been established antisubmarine air doctrines. The group by itself had to develop the tactical doctrines from the start. It was necessary, therefore, for the group to be allowed much time for initial training and tactical study. However, the shipping situation had been deteriorated so wretchedly that the group was pressed to assume its mission about the middle of January 1944. In addition to the lack of airmen's skill, there was a difficulty of communication between the air and the surface. Even the escort vessels, not to say merchant ships, had no facilities for direct communication with the air. Thanks to extraordinarily painstaking effort by the of-

ficers and men of the 901st Naval Air Group, the progress of their skill was rapid, and tactical doctrines were soon developed. However, the air and surface co-operation was very slow to develop.

Communications

Certainly one of the softest spots in the Japanese antisubmarine warfare existed in communications. At the time when the GECH was created in November 1943, the communications officer of the headquarters was surprised to find out that the system of communications varied according to each escort-of-convoy area because of an utter lack of unified control. While almost all convoys had to sail through two or more areas, it was impossible to secure good co-operation between neighboring commanders and between escorts and local patrol forces.

Within a convoy itself, the situation was not much better. As we have seen, only four destroyers were organized into a destroyer group. All other ocean-going escorts were administratively independent of each other. There was neither unified tactical doctrine nor unified communication training between these individual escorts. These escorts were temporarily assembled and composed to form an escort group as they were made available and as the occasion demanded.

Personnel

The overwhelming majority of these ocean-going escorts were "captained" by graduates from merchant marine academies. No matter how experienced they were in navigation and seamanship, merchant marine academy graduates proved, after all, to be inadequately qualified to unify and command a group of escorts. Moreover, they generally lacked interest in tactical matters.

Because of the serious shortage of Naval Academy graduates, the Navy Ministry adhered to the policy of appointing as commanding officers of the frigate-class ships graduates from merchant marine academies. To formulate a permanent group of escorts would require an appointment of a competent Naval Academy graduate as the group commander. Despite persistent solicitations by the GECH, the Naval Ministry continued to turn a deaf ear.

In communication equipment and personnel, escort vessels were poorly treated. Equipment of obsolete types and personnel of an inferior record were appropriated to these ships, since the Navy always gave priority to the equipping and manning of the battleships, cruisers, and carriers of the combined fleet. The communication division of a frigate consisted of six radiomen and one cryptographer. It was only after an importunate plea by the GECH that the Navy Ministry decided to increase the personnel by two radiomen and one cryptographer, including at least one person whose skill was considered average or above by the standard of the Navy.

The condition of merchant ships was hopeless, indeed. The Army relentlessly exercised its authority to conscript men of military age. Naturally, the majority of merchant marine radiomen had been taken away to the armed forces. It was only after the shipping situation became irretrievably serious that the military authorities came to be more considerate in the matter.

The GECH efforts to introduce TBY (intraconvoy radio telephone system) met a belated partial success in the case of escort vessels, and ended in complete failure in the case of merchant ships.

One of the most pressing needs felt by the GECH was the use of radar in antisubmarine warfare. By the fall of 1943, both antiair and antisurface radars had been generally installed on first-line combat vessels of the combined fleet. As soon as the GECH was inaugurated, we made a strong plea for installation of the device on escort vessels and antisubmarine

planes. Beginning in the spring of 1944, some of the escort vessels were experimentally equipped with it. However, it was not until late in the year that the electronic weapon became generally used by most of the ocean-going escorts.

A Convoy System

There was no question that the best means to prevent the mounting shipping losses was to adopt a convoy system in full measure. As we have seen, however, in the fall of 1943 a cry was still very loud for a faster circulation of shipping. On the other hand, there was no hope of an early remedy of the extreme shortage in escort vessels. The GECH, caught in the dilemma, hit upon an idea that a faster shipping circulation would not be necessarily unfeasible if the best use of geographic advantage was made.

System Details

The idea occurred first to Admiral Oikawa. He himself penciled the plan, the essential part of which was as follows:

1. To make the sea area linking the East China Sea, the Formosa Strait, and the South China Sea safe from submarine invasion, so that within the sea area merchant ships would be able to sail independently, without forming a convoy, and thus secure the highest possible efficiency of shipping circulation. To connect the island-chain including Nansei-shoto Islands, Formosa, the Philippines, and Borneo with mine barriers. To guard these sea-gaps where the minelaying was not feasible with land based radars and sonars as well as with patrol planes and patrol vessels.

2. The sea belt along Nampo-shoto (including the Bonin Islands and the Volcano Islands) and the Mariana Islands was to be guarded with radar stations which would be installed on these islands as well as patrol planes and ships, so that enemy submarines would find it difficult to invade the sea belt. Convoys would sail within the belt.

3. The sea lanes along the southern coast of Honshu (between Yokohama and Kobe) and along the eastern coast (between Yokohama and Hokkaido ports) would be guarded with shore based radars, patrol planes, and patrol ships, so that ships would be free to sail safe from submarine menace. In those days, the Sea of Japan and the Yellow Sea were not infested with submarines. The idea was very enthusiastically received by the Government circles, although the Naval General Staff gave only half-hearted support.

Obstacles

The Naval General Staff first insisted that all mines, then on hand, had to be reserved against the probable entry of Russia into the war. Although this obstacle was at last overcome, and although the Government consented to appropriate the necessary materials for the production of a sufficient number of mines, only four minelayers were made available. The minelaying took so much time that only the East China Sea and the Formosa Strait had been partly mined before the air supremacy over the projected sea area had been wrested from Japan's hands. As for shore based radars, the blueprint was completed in no time, but only one or two stations were actually installed before Okinawa was taken.

Further Delay

In the meantime, the GECH delayed the adoption of a full-fledged convoy system. As late as mid-February 1944, the Government was very much averse to the adoption of a convoy system. The more tonnage which was lost, the speedier circulation of shipping was needed in order to make up for the loss of shipping capacity. The foregoing safety-zone plan was an honest reflection of the atmosphere. With no reasonable hope of success, the GECH attempted to set up such

safe navigation zones in accordance with Oikawa's program. Indeed, the GECH was pressed by those concerned with shipping activities to have more ships freed from convoys, although convoys then formed were of a very small size, usually consisting of from two to five ships.

Convoy Routing

In the GECH, I was in charge of arranging and routing convoys. In 1938-39, I had studied British affairs in the Intelligence Bureau of the Naval General Staff and I knew more than the average Japanese about the convoy system the British Navy adopted in 1939. Late in 1939, some British naval bulletins describing escort-of-convoy activities were captured from an air mail bag dropped into the sea by a British plane. Of course, I had drawn various lessons from the British World War I experience. However, I had lacked first-hand experience. It took some time before I became confident in my opinion that a full-fledged convoy system must be adopted at any cost. On 3 February 1944, an important oil tanker convoy was annihilated by a submarine in the middle of the East China Sea. The convoy had been escorted by a frigate of the best type. One escort for each two ships was, of course, the best possible protection which the GECH could provide. This incident convinced me that one escort lacking co-operation with other escorts was of little use.

On 19 February a more serious incident occurred, this time in the middle of the South China Sea. Five middle-size tankers, fully loaded with oil, hurried home escorted by one of our best frigates. This convoy was considered an unusually important one, the safe passage of which was anxiously awaited in an oil-thirsty Japan. The report that all of the five tankers had been sunk caused a great shock. Of course, I, as operations officer of the GECH, was especially sorry.

A New Proposal

I at once proposed that the system of convoy be reformed so that at least three escorts would be attached to each convoy plying between Moji and Singapore. Since in those days a convoy had been composed of from 2 to 5 ships with an escort, the proposal meant that each convoy should include about 15 ships.

To the Americans and British who used to run a convoy of as many as 70 ships in the Atlantic, the operation of a 15 ship convoy is nothing but child's play. As we have seen, however, the Japanese preferred as small a convoy as possible.

Escort commanders also were afraid to include a large number of ships in a convoy. The formation of a convoy in more than three columns abreast was thought to cause confusion and collisions. Ships' masters were not trained for such complicated formations, and intraconvoy signals were extremely poor. Such being the case, when I made the proposal, I rather expected it would meet considerable opposition.

THE BEGINNING OF THE END

It happened that February 1944 saw Japanese dreams shattered in quick succession. Early in the month the Marshalls fell. The combined fleet, which had long planned to fight a decisive engagement at the first opportunity, did nothing to challenge the invading United States fleet. Instead, it retreated to the homeland and to Palau.

Having thrown ashore all its carrier-borne flying units to fight a war of attrition in the Rabaul area contrary to the supreme decision at the 30 September 1943 Imperial conference, it was only natural that the combined fleet was unable to meet the United States fleet at this time.

On 17-18 February, the United States carrier task forces suddenly raided Truk, which had long been used as the major

base of the main body of the combined fleet. Although the fighting groups of the fleet had been evacuated, there still remained in the harbor many tankers and cargo ships of the fleet trains. In the 2-day raid, a colossal sum of nearly 200,000 gross tons of shipping was sunk or otherwise disabled. When the news reached Tokyo, the shock was beyond description.

In addition to the foregoing disasters, there was another factor which worsened the shipping situation. To the utter neglect of the often quoted 30 September decision, the High Command had used and spent a great amount of tonnage by continuing the struggle in the Rabaul-Solomons area. The projected fortification of the Marianas-Carolines-western New Guinea zone had thus been neglected. Now, this vital zone was exposed, defenseless to an impending attack by the United States fleet. The immediate fortification was needed, but there was no shipping available unless appropriated from the civil pool. No matter how wretchedly depleted the civil tonnage itself was, the civil authorities could not help responding to the military request. A new transfer of 300,000 gross tons was agreed to.

Although the exact reason was not clear at the time, it may be probably because of the recent losses that the proposal of a full-fledged convoy system was agreed to even by those who had thus far been strongly opposed. It seems the sudden and drastic reduction of tonnage caused everybody to admit that the preservation of tonnage was more essential than shipping circulation.

Large Convoy System

We called the new convoy system "a large convoy system." By American and British standards, it is certainly a misnomer, since the new system envisaged a convoy formation of only 10 to 20 ships. However, we were quite sincere in calling it that, and the system became operative in the beginning of March.

An extensive transportation of troops and materials was started to the Marianas and the Carolines in March and to the Moluccas in April. The Naval General Staff and Navy Ministry, which had been reluctant to appoint Naval Academy graduates for antisubmarine warfare, created an Escort-of-Convoy Headquarters command, for the immediate purpose of ensuring the possible passage of the mid-Pacific transportation. Since the adoption of a large convoy system required an efficient command organization, this was a very welcome coincidence.

The composition of the Escort-of-Convoy Headquarters had a fundamental weakness. The key personnel consisted of a commander and a staff officer, the latter being a temporary appointment.

Although the over-all shipping losses in March were still very high owing to air destruction at Palau, the losses inflicted by submarines were greatly reduced in March and April. The reduction was generally considered to be a result of the adoption of the new convoy system. However, the reduction was short lived. Beginning with the last part of April, the toll of the submarines was again intensified. Soon it became known that the enemy initiated wolf-pack tactics.

Continued Combined Fleet Concept

To meet the wolf-pack tactics, the GECH felt it necessary to have frigates organized in groups on a permanent footing under each able group commander. Only temporarily assembled, escort vessels could not co-operate efficiently. However, to secure the appointment of able group commanders for frigates, it was necessary to have these officers transferred from the combined fleet, in which almost all qualified officers were then in service. The Escort-of-Convoy Headquarters was unfit for the task because it was activated only immediately before the sailing of each

convoy, and was inactivated as soon as each convoy trip ended. It was incapable of training escort forces prior to its getting underway.

Although it was out of the question to get the foregoing requirement met at the time when the combined fleet was in a hot preparation for the Battle of the Philippine Sea (*A-Go* Operation), I thought that with the loss of the fleet duel the Navy would give more weight than ever before to the GECH's plea.

A Wingless Eagle

In that battle, almost all carrier-based flying units perished. It occurred to me that, being deprived of carrier forces, the First Mobile Fleet (the backbone of the combined fleet surface strength) was like an eagle without wings. It would be possible no longer for her to fight a modern sea battle. To maintain the crippled fleet would never pay. All remaining manpower and material of the Navy could better be utilized in boosting shore based air strength and in supplementing escort-of-convoys forces. At any rate, the importation of such materials as oil, rubber, and bauxite from the south had to be speeded up with more efficient protection. For the purpose, manning the escort forces with more and better personnel, both officers and men, was urgently needed. The only source from which these personnel could come was the First Mobile Fleet.

With the fall of the Marianas having been made definite, the Naval General Staff held a map war game from 24 July through 27 July to study future strategy.

In the meantime, only one frigate group consisting of four ships was organized in July with a captain as the commanding officer. This was the answer to our persistent plea for many months.

Reorganization

On 3 August 1944, Admiral Oikawa was made Chief of the Naval General Staff, and Admiral Naokuni Nomura was appointed as Commander in Chief of the Grand Escort Command. At the same time, the GECH was subjugated to the combined fleet headquarters in case of a major battle along the Kurile-Japan-Formosa-Philippine line. Thus, the short-lived system in which the combined fleet headquarters and the Grand Escort Command Headquarters were juxtaposed came to an end. This new command relationship was destined to produce a disastrous effect upon the sinew of the antisubmarine warfare in a few months.

During 12-14 October, the American fast carrier task force raided the Ryukyus, Formosa, and Luzon. The combined fleet directed the Grand Escort Command Headquarters' 901st Naval Air Group to act as reconnoitering force. Thanks to strenuous effort and ingenuity of its officers and men, the air group had become capable of using its radar fairly efficiently against submarines since about the end of July. The GECH had hoped that as the wider use of radar by the air group became feasible, the antisubmarine warfare would be improved to a considerable extent. The 901st Naval Air Group was considered the unit best qualified in the entire Navy as reconnoitering force because of its ability to detect such a small target as a submarine.

Final Action

Since any daylight attack was not feasible because of the great air superiority of the enemy, night attack was necessary with the aid of radar reconnaissance by the 901st. However, the result of the battle was disastrous. All of the radar units of the 901st Naval Air Group perished because of strong counter-attack by the enemy. Although the Japanese people as a whole, with the Naval General Staff taking the lead, were jubilant over the self-appointed "victory of the air battle off Formosa," the GECH

was very sad. The source of future hope for the improvement of antisubmarine warfare was gone. Moreover, an examination of preliminary combat dispatches reaching the headquarters caused grave doubts about the battle result claimed by the Naval General Staff.

It can be said, however, that as far as the antisubmarine warfare was concerned, the decisive phase was over by the fall of 1944. With the enemy's air supremacy extended well up to the shores of China and the Japanese homeland, his submarine offensive against Japanese shipping was considered to have been relegated to a secondary importance. From this time on, the Japanese shipping protection warfare was fought chiefly against the menace from the aircraft and air-strewn mines. True, antisubmarine effort was still continued until the very end of the war. Belated exertion was made for the improvement of training and equipment in the field of antisubmarine warfare. However, by the fall of 1944, the Japanese antisubmarine warfare had irrevocably failed.

CONCLUSIONS

In the Japanese Navy, the single concept was long since born—the concept that the combined fleet was the sole embodiment of the Navy. The combined fleet, in its turn, was gripped in a single concept that the fleet-versus-fleet action was the only warfare it must aim at. The task of protecting the sea-borne trade was miserably slighted. The Navy sold the concept to the Nation. The Nation expected the Navy would win in fleet actions and overlooked the trade protection. If a fleet action were lost, the Navy's popularity would be undermined. On the other hand, the failure in antisubmarine warfare could be left unobserved. It was only natural the Navy was more eager to win a fleet action than to succeed in antisubmarine warfare. By the end of the war, economic hardship was felt keenly and the effect of sea blockade was visible everywhere.

Greatest Cause of Defeat

The Government reported to the Diet, which was convened immediately following the surrender, that the greatest cause of defeat was the loss of shipping. However, it is problematical whether this lesson will be long remembered.

The picture of a fleet action is colorful, while that of antisubmarine warfare is monotonous and unattractive. Although the result of the fleet action is obvious to everyone, the effect of shipping losses is insidious even to a keen economic observer until it becomes unretrievably acute. At any rate, in the Japanese postwar publications, the stories of fleet actions are emphatically told by numerous writers, while little has been told about the antisubmarine activities.

Of late, the Japanese people, at least in certain quarters, are discussing the problem of rearming. Voices from the United States as well as events in Korea are no doubt influencing the course of the discussion and even the way of thinking. So far, the Japanese discussions seem to be limited to the rebuilding of ground armament. Although many military experts seem to believe otherwise, the public generally is concerned, above all else, about the possibility of the Soviet troops invading our island country.

On the other hand, the Nation is little warned against the large building of the Soviet submarines. There seems to be a new single military concept. Maybe our people are at their ease believing the American Navy will do all the job of protecting Japanese shipping from Soviet submarines.

CARRIER STRIKE

SINCE the invasion of South Korea by the North Korean Communists, carrier based planes of the United States Seventh Fleet have aggressively supported the United Nations forces in their efforts to stem the Communist drive in that area.

Jet fighters, with fighter and attack bombers, have flown thousands of sorties from their "sea-going air bases" to areas far behind the enemy lines. They have strafed and bombed Communist troops in close air support of the United Nations ground troops. *Skyraider* attack bombers have even used aerial torpedoes in demolishing key enemy areas, thus hampering transportation and movement of the Communist forces when they were massing for offensive drives.

Carrier based bombers have taken off from their flattops some 60 miles out at sea to hit strategic enemy targets such as oil refineries and dams.

Strike planes can carry a variety of armament—1,000-pound armor-piercing bombs for concrete and log-covered pits and road blocks; 500-pound bombs for tanks, bridges, and artillery pieces; 100-pound bombs with variable time fuzes for antipersonnel use; Navy-developed RAM rockets capable of drilling through the armor plates of most modern tanks; plenty of ammunition for the planes' machine guns; and best of all napalm, the fire bomb.

A carrier is a conglomeration of many amazing things. To begin with, it is a sea-going home for nearly 3,000 men. It is a combination of vast spaces and a series of tight passages, steep ladders, and dizzy catwalks. Every movement aboard this floating airfield is logically and minutely planned.

A successful carrier strike must be supported by highly trained men of the ship's company who have specific duties to perform. This particular phase of naval warfare involves the efforts of every man aboard the flattop.

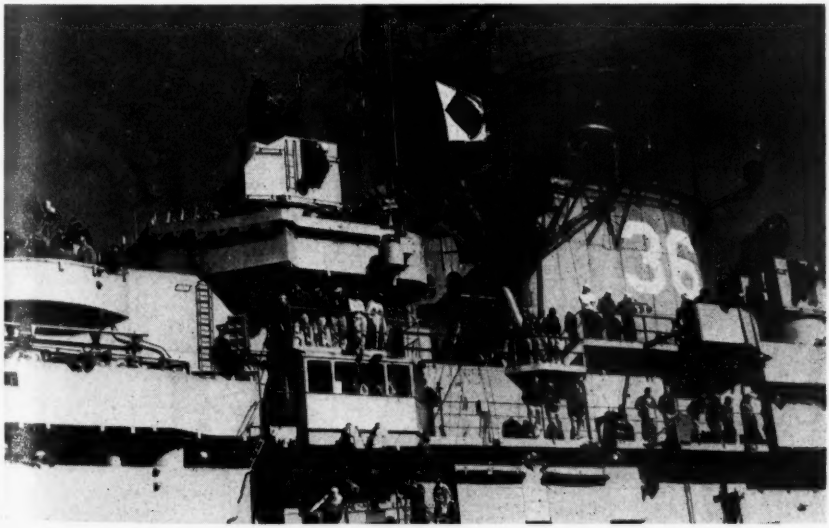
The planes must be prepared and serviced so that they can reach their target, accomplish their mission, and safely return home. There must be precision teamwork between the pilots and catapulting crews in getting the aircraft, loaded with high explosives, airborne. The traffic cop movements of the flight deck officers and crewmen must be carried out with efficiency and speed to get the planes airborne in a minimum amount of time and without accident.

As soon as the planes leave the carrier, preparations are made to handle their return landings, care for injured flight personnel, and any mishaps during the receiving of planes. After the flight has returned, each pilot, while the memory of the mission is still in his mind, gives an oral report of his version of the strike to an intelligence officer. Meanwhile, the crew prepares the planes and equipment for the next carrier strike.

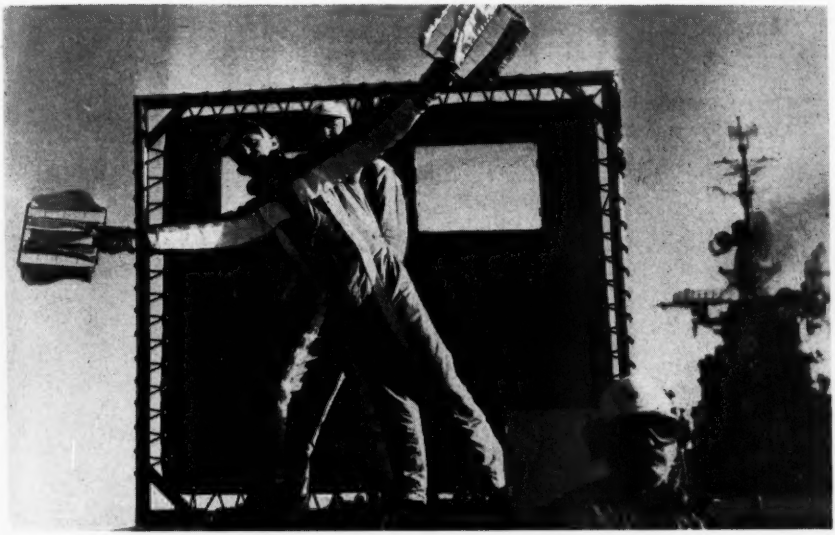
Naval aviation is playing an important part in the United Nations efforts in Korea. Carrier based aircraft have been giving close air support to UN ground troops in addition to conducting individual strikes

Carrier based planes can carry a variety of armament—from 1,000-pound bombs to .50-caliber bullets. Above left, crewmen do some last minute inspecting and checking prior to take-off time. Above right, ordnancemen supplying detonating mechanisms to bombs. Below, an *F9F* jet fighter being readied to take on armament.—Department of Defense photos.

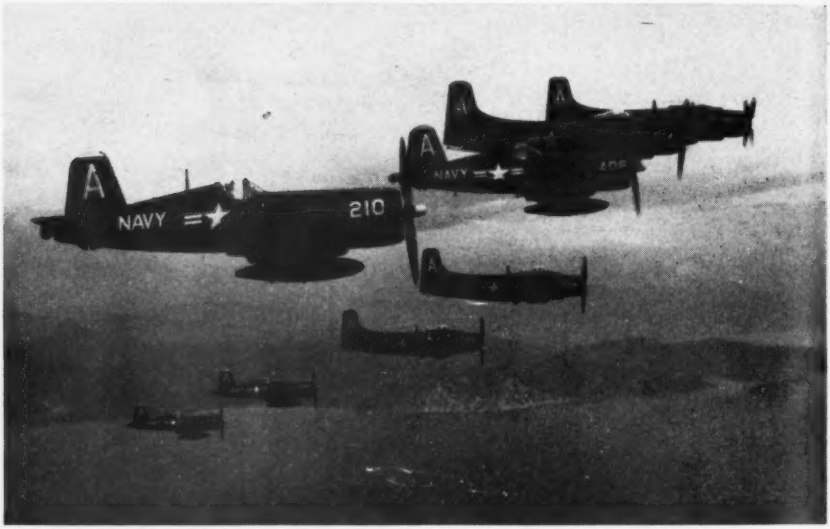
A successful carrier strike must be supported by highly trained personnel who have specific duties to perform at specified times. Above, three pilots checking their maps following a briefing concerning their target. Below, a signal flag on the carrier's "island" alerting all hands that planes are to be launched.—Department of Defense photos.



Precision teamwork between the pilots and catapulting crew is essential in getting the aircraft, loaded with high explosives, safely airborne. Above, a plane director guiding an *F9F* Gruman jet fighter to a catapult. Below, two crewman crouching to escape the gas exhaust of a catapulted *F9F* Gruman *Panther*.—Department of Defense photos.



Skill and care are essential for the successful landing of planes on the constantly moving carrier flight deck. Above, a landing signal officer signaling the pilot of an approaching plane that he should pick up his right wing. Below, a *Skyraider* attack bomber is "in the groove" landing on the flight deck.—Department of Defense photos.



Work never ceases aboard an aircraft carrier—whether its planes are airborne or they have returned from their strike. Above, *Skyraiders* and *Corsairs* flying in close formation toward their target. Below, the ship's company preparing planes for the next day's work after securing from "flight quarters."—Department of Defense photos.

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Savings From Suggestions

Suggestions submitted by military and civilian personnel during the 1952 fiscal year resulted in a saving of at least $7,860,000, according to a recent Army estimate.—*Armed Force.*

Television for Railroads

Pint-size television recently helped run a railroad. In tests in a Chicago railroad yard, three newly developed industrial television systems enabled personnel sitting inside to perform functions normally requiring considerable walking and extra movement of freight cars.

Instead of walking along the tracks to list car numbers on an incoming train, a checker sat before a television screen and jotted down the numbers as the cars passed before a small unattended television camera. These numbers are needed in switching operations for making up trains destined for various parts of the country.

Supervisors witnessed on the screens of the other two television receivers the disposition and movement of all cars and switching engines in the yard.

The panoramic views were picked up by two small cameras mounted atop the yardmaster's tower on bases that could be rotated at will. The cameras weigh only 7½ pounds each.—News release.

Navy 'Tramway'

The Navy is testing a new device which is designed to enable amphibious forces to land equipment in areas where they cannot beach landing craft. The device, called the "Tramway," consists of cables that will stretch from a tower on shore to a vessel up to 500 feet from the beach, and will carry a ton of equipment on each trip.—*Marine Corps Gazette.*

Plastic Casts

A plastic powder has been developed for new type plastic casts. The strength of the new composition is such that casts may be up to two-thirds lighter in weight, and even though they make thinner casts, they provide adequate immobility and support within a few hours after application, permitting the earlier release of patients. The composition is porous enough to permit evaporation of moisture from the skin and is water resistant.—*Combat Forces Journal.*

Rise in Aircraft Jobs

By the first quarter of 1954 the aircraft industry will have more than tripled its "pre-Korean work force" and aircraft and aviation equipment will be manufactured in 33 states across the country.—*The New York Times.*

Atomic Submarine Crew

Selected Navy officers and men have been training for several months to man the world's first atomic-powered submarine when it is ready for sea, probably sometime this year or early in 1954.—News release.

Electric Brain

The Army's newest "electric brain" can multiply 642,824,734,549 times 598,243,739,378 and come up with the right answer—384,565,872,961,263,988,370,522—in one-thousandth of a second.

Solving such eyebrow-raisers is all in a day's work for ORDVAC—Ordnance Discrete Variable Automatic Computer. This "brain" can solve in a jiffy mathematical problems that would make all but the experts throw up their hands in despair. It is 100,000 times faster than the fastest human arithmetician on the tougher problems, and it can do as much work in a week as the best figures expert equipped with a desk calculator could do in twenty centuries.—News release.

Merchant Marine

The United States merchant marine consists of 3,344 cargo vessels and tankers, according to a recent report by the National Federation of American Shipping. Of that number 1,275 are privately owned, 62 are Government-owned under charter, 124 are Goverment-owned under general agency agreements, and 1,883 are in the reserve fleet.—News release.

All-Jet Seaplane

A contract to build the Nation's first all-jet seaplane has been awarded by the Navy. Details on design and planned performance have not been released because of reasons of military security.

The Navy has said, however, that the seaplane would be called the model *275 Seamaster* and that it would be "radically different in concept and design from past models."—News release.

Guided Missile Battalions

The Army has announced that it is forming antiaircraft battalions armed with guided missiles.

The new units, which are expected to be ready this year, will be equipped with the "Nike" missile which the Army says is able to track down and destroy an airplane 10 miles away at an altitude of more than 6 miles.—News release.

Co-ordinate Guided Missile Work

A step toward closer co-ordination among the military services in guided missile research and testing projects, particularly in the firing phase, was made recently, when the operational control of Navy and Air Force facilities in the area of the White Sands Proving Ground at Las Cruces, New Mexico, was placed under the Department of the Army. The Department of Defense announced that the move is also designed to increase efficiency, and to effect economies.

The White Sands Proving Ground, the guided missile center for Army Ordnance since 1945, now will include the Air Force's Alamogordo bombing range, thus becoming the country's largest land-firing range for guided missiles. It covers an area of about 40 miles by 90 miles.—*Armed Force.*

Lightweight Compressor

The Army Chemical Corps has adopted a new lightweight compressor for supplying pressure to flame throwers.

Unlike its 850-pound predecessor, the *M-1*, the new 60-pound compressor can be carried on a man's back and operated near the battlefront on rough terrain without danger of its turning over.

The new compressor lacks the capacity of the old one, but it will pressurize three portable flame throwers at a time, taking about 4 minutes for each tank. The *M-1* can handle six flame throwers at the rate of 2 minutes for each tank.—News release.

Oxygen for Jets

Oxygen generating plants will make our aircraft carriers self-sufficient in providing oxygen for jet plane operation. Developed under a Navy Bureau of Ships program, the shipboard plants produce 500 cubic feet of gaseous oxygen and 1,500 cubic feet of gaseous nitrogen each hour.

Weighing only 20,000 pounds, the plants in 5 days produce enough oxygen to fill 70,000 pounds of empty compressed gas cylinders.

The oxygen is used by high-flying jet pilots; the nitrogen, a by-product, is used for purging aircraft gasoline lines.—*MSTS Magazine.*

Cheaper Snorkel Masts

A new design of extensible radio and radar masts for snorkel submarines, produced by the Navy Bureau of Ships, will result in savings of more than 2½ million dollars. These masts were originally forged and pierced from solid stainless-steel billets, a process requiring 11,320 tons of steel to produce about 400 masts with a finished weight of 400 tons. By using low-alloy steel tubes covered with a skin of monel cladding, metal requirements are reduced to only 465 tons, of which 50 tons are machined away, compared with 10,920 tons of scrap produced by the original process.—*Ordnance.*

Vest-Pocket Battery

A flexible-cased battery has been developed which can be worn as a vest under arctic clothing, thus utilizing the warmth of the soldier's body to protect the battery against cold.

One of the problems of operating small radio sets in very cold climates has been the fact that standard dry batteries lose voltage rapidly in the extreme cold, making radio operation unsatisfactory.

The first models of the vest pocket battery were for the Army's AN/PRC-6 "Handie-Talkie."—*Technical Data Digest.*

New Artillery Piece

The Army has unveiled a new artillery piece—a 280-millimeter rifle which can fire both conventional high explosives and atomic shells. The 85-ton weapon, which shoots an 11-inch projectile for at least 20 miles, is transported by front and rear

Above, the gun and transporters in traveling position. Below, the gun being fired.

tractors resembling an oversize fire department hook-and-ladder.

Each of the transporters has a 375-horsepower engine, and each has a cab and driver. They can operate singly or together; when together, the controls of one cab are effective for both ends of the push-me-pull-you setup. The drivers communicate with each other by telephone. The transporters can also turn at right angles to the gun carriage and pull it sideways. Experts working with the gun say that "under pressure" they could move it into a new position and have it firing within 15 minutes after arrival.—News release.

Army Information Program

More than 450 Army newspapers and 69 oversea radio stations supplement the formal information program of the Army. —News release.

Stronger Magnets

A new magnetic material developed by the Naval Ordnance Laboratory exhibits a coercive force of 3,000 oersteds—greater than any known permanent magnetic material. Composed of bismuth and manganese, the new material has a flux density exceeded only by platinum-cobalt alloy. Magnets can be made by power-metallurgy technique, thus ensuring close tolerance of complicated shapes without machining. Production involves heating powdered manganese and bismuth at 700 degrees centigrade and hot-pressing the resulting bismuthide at 300 degrees centigrade in a strong magnetic field.—*Ordnance.*

Aircraft Production

The production of fighters and bombers for the Air Force has been multiplied by five times in the two critical years since the outbreak of the Korean conflict, and, in that time, more than 10,000 military planes have been delivered to the Nation's air services.—*Armed Force.*

Teletypewriter Network

New supply efficiency and economy are expected from a communications network recently installed by the Signal Corps.

The modern service—a teletypewriter network—provides a central point with an up-to-the-minute, daily inventory of supplies and equipment at points scattered throughout the country. It makes possible a speedy compilation of both shortages and surplus items.

Such supply information previously was reported to a national control point by mail, with a time lag ranging from 4 to 14 days. Lag time now can be cut to less than a day.—News release.

Railway Flatcars

The first of several hundred huge railway flatcars developed by the Army Transportation Corps are now rolling off production lines and are already being put to use in moving the Army's new tanks and other heavy military equipment.

The new 54-foot cars can be loaded with two *M47* tanks which heretofore were loaded but one to a car. The tanks weigh 93,000 pounds each, very nearly the capacity of the cars which are rated at 200,000 pounds—about double that of the average commercial-type flatcar.—*Ordnance.*

Rubberized Roads

Rubberized road materials being developed at the University of Kentucky may be the engineers' answer to stretching the life of heavily traveled highways that become quickly worn under the normal load of cars, trucks, and busses.

Research engineers believe that adding rubber to the ordinary bituminous road-surfacing material should make the pavement more rugged. The scientists are testing their theory in the University's highway laboratory where a "fatigue" machine treats samples of rubberized road-surfacing materials just as trailer trucks would. Other machines and tests "age" the samples and subject them to the simulated heat of a blazing summer sun and of frigid winter temperatures.—*Science News Letter.*

Revise Oversea Policy

The Army has announced that servicemen assigned to oversea commands after 1 February of this year must have at least 9 months of duty remaining.

The present policy requires a minimum of 6 months remaining service. The Army said its improved manpower position will permit the change. Exceptions will be made for officers and enlisted men having less than 12 months to serve before reaching legal retirement age. They will not be assigned overseas.—News release.

Gamma Ray Generator

A gamma ray generator designed specifically to give reproducible uniform total body irradiation was unveiled recently by the Navy. Development of the new generator will help speed the Navy's research into effects of gamma rays on a variety of "target" materials.—*Armed Force.*

Power Plant Computers

Circular slide-rule devices used to check the accuracy of aircraft engine performance are being distributed to Air Force *B-36* flight crew members throughout the United States by the manufacturer of the heavy bomber. The devices are used in flight to solve power plant performance and operation problems on both piston and jet engines. The plastic computers contain movable, logarithmically divided scales to calculate problems involving multiplication and division. Use of the computer enables a *B-36* flight engineer to determine such factors as horsepower output, propeller shaft torque, and pounds of fuel consumed at any given altitude, temperature, and speed. On the reverse side of the computer are scales to compute density, altitude, and air speed.—*Technical Data Digest.*

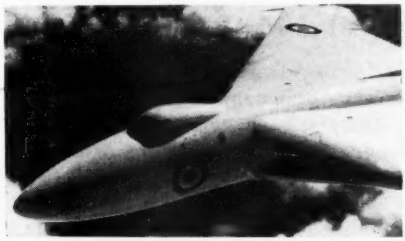
Load Capacity Indicator

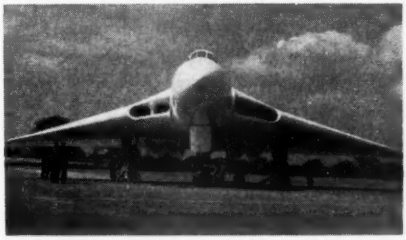
A simple device is being installed on cranes at the San Francisco Port of Embarkation to prevent overloading and improve safety in operations. It consists of a quadrant or boom load capacity indicator which instantly shows the crane operator the angle of the boom and the maximum load the crane can handle at that angle. The indicator is a free-swinging pendulum which comes to rest over a set of figures representing the angle and capacity for each position of the boom. Another advantage is the location of the indicator close enough to the operator so that he can read it without leaving the controls.—*Technical Data Digest.*

GREAT BRITAIN

World's First Operational Delta Bomber

Great Britain recently took off the secret list the world's first four-engine operational delta-wing jet bomber, the *Avro 698.* The introduction of the new heavy bomber marks the successful climax





Two views of the new *Avro 698* bomber, which is now in production in Britain.

of a program of research, design, and development which began early in 1947.

All details of the new bomber are still secret, except the fact that it is powered by four turbojets. It is said to be able to fly at speeds approaching that of sound and capable of carrying large bombs over great distances at heights which will give it considerable immunity from air and ground defenses.—News release.

Army Strength

The British Army will have a strength of approximately 540,000 by April of this year (MILITARY REVIEW, Jun 1952, p 71). This figure includes colonial troops and the women's services, but the total British military element will be approximately 445,000 by the same date.—News release.

INDOCHINA

Mutual Security Fund

The Mutual Security Agency recently turned over 25 million dollars to the associated states of Indochina. About 20 million dollars will be used to purchase machinery for arms factories, uniforms, and vehicles, and the rest will be used for economic purchases.—News release.

FINLAND

Trade Agreement

The first trade agreement between Finland and Communist China was signed recently in Moscow. The agreement is similar to those with Poland and Czechoslovakia, under which the Soviet Union is a partner. Finland will send to China wood pulp, newsprint, and cardboard, and will receive Soviet cereals, oil products, cars, and scrap iron. In addition, Communist China will deliver to the Soviet Union certain other unlisted products.—*The New York Times.*

UNION OF SOUTH AFRICA

Arms Factory

The Government is erecting an arms factory for the production of antitank and air-to-ground rockets, rifle and machine gun barrels, and other component parts. The factory, the first of its kind to be established in the country, has been designed so that it will allow for rapid expansion in time of war.—Union of South Africa Government Information Office.

HONG KONG

Reservoir Project

Construction has begun on a huge reservoir in an attempt to eliminate Hong Kong's perennial water shortage. The dam, 1,000 feet long and 150 feet high, is expected to be completed in about 3 years.

Hong Kong has been on water rations for several years because the population has been trebled by refugees from Communist China.—News release.

CZECHOSLOVAKIA

Faster-Than-Sound Jets

Czechoslovakia now has jet planes that can travel faster than sound, according to the Prague radio.—News release.

TURKEY

Abolish Visas

Turkey has made agreements with Sweden and Norway for the reciprocal abolition of visas. Visa requirements for travel between Turkey and Greece by nationals of the two neighbor countries also have been abolished.—Turkish Information Office.

Highway Construction

Turkey's program of modern highway construction and maintenance is being extended as an important defense measure in co-operation with the Mutual Security Agency, which has just approved a grant of $3,155,000 for this purpose.

Begun in December 1947 and estimated to cost about 58 million dollars, the development of road building in Turkey has already resulted in the construction of more than 3,500 miles of two-lane, all-weather highways. In addition, 15 highway maintenance shops have been set up, and 5 more will be equipped through the new financing, which allocated about $2,655,000 to purchase additional road construction and repair equipment. The remaining $500,000 will be available for the technical services of 37 experts of the United States Bureau of Public Roads.—Turkish Information Office.

'Donkeys on Wheels'

The lighter side of expanding mechanization in Turkey is reflected in a report to the effect that bicycles, affectionately referred to as "donkeys on wheels," are replacing donkeys as the Turkish villagers' favorite means of low-cost locomotion at the rate of nearly 10,000 each month.—Turkish Information Office.

EASTERN GERMANY

Aircraft Industry

The East German Government has earmarked 14 million Ostmarks as a first appropriation for building up its own aircraft industry. Several hundred high-level designing personnel reportedly have been signed up for the new venture.—*Aviation Age.*

Police Force

Eastern Germany's police force, which is reported being expanded as the nucleus of a future army, is said to have been organized into 24 division cadres, each equipped with Soviet tanks and artillery.

The report, by the Fighting Group Against Inhumanity, an anti-Communist agency that operates underground in the Soviet zone of Germany, stated that convoys of new armaments were arriving at night from the Soviet Union to equip the new force. The group also announced that since a recruiting campaign began in June, the police had swelled from 85,000 to 100,000 men.—News release.

Parachutist School

A school is being established at Ruhla near Erfurt where "deserving" members of the Free German Youth, a Communist youth organization, will be trained as parachutists.—*Aviation Age.*

Rocket Warfare

The Soviets have made much progress in the development of rocket warfare and are firing off test missiles into the Baltic from the old Nazi bases in Eastern Germany, according to an announcement by Western Germany's Security Commissioner.—News release.

RUMANIA

Chemical Industry

Communist Eastern Germany will develop Rumania's chemical industry under an agreement recently signed in Berlin.—News release.

KOREA

Medical Treatment

The Norwegian surgical field hospital in Korea has treated more than 7,000 wounded United Nations soldiers and Korean civilians since June 1951.—Norwegian Information Service.

JAPAN

Trade Pact

Japan and Brazil recently signed a 1-year trade agreement calling for the expenditure of 68 million dollars, almost equally divided between the two countries. —*The New York Times.*

National Safety Corps

About 100,000 Japanese youths applied to join the army-like National Safety Corps during a recent recruiting drive. About 30,000 of the applicants will be selected to take the places of men who left the Corps recently on completing 2-year duty tours.—News release.

NEW ZEALAND

Aid for Indochina

New Zealand, with United States concurrence, has given France for use in Indochina 13,000 rifles, 600 machine guns, and 750,000 rounds of small-arms ammunition. The supply was surplus lend-lease matériel.—News release.

CANADA

Helicopter Survey

Using two helicopters, five Canadian geologists during the past season made an aerial geological survey of 57,000 square miles of territory in northwest Canada and accomplished as much at the same cost as it would have taken a ground party 25 years to do. The survey was undertaken where deposits of gold, nickel, and copper were believed to exist. Findings already established indicate that there is every probability that the area will become the scene of much mining activity.—*The New York Times.*

CUBA

Embassy Agreement

The Foreign Minister has announced that Colombia and Cuba have agreed to raise their diplomatic missions to each other to embassy rank.—News release.

PAKISTAN

Barter Agreement

Pakistan and the Soviet Union recently signed a barter trade agreement for the exchange of Soviet wheat for Pakistani jute and cotton. The value of goods and services from each country is about $16,800,000.—*The New York Times.*

Mapping Project

A Canadian organization has been awarded a 2-million-dollar contract to conduct a 4-year aerial mapping project in Pakistan. The assignment will involve 42,000 square miles of mapping for land-improvement projects in addition to 123,000 square miles of geological mapping.

The mapping project is to be financed by the Canadian Government as a contribution to aid Pakistan under the Colombo Plan.—*Canadian Aviation.*

Navy Dockyard

The foundation stone was laid in Karachi recently for Pakistan's first naval repair dockyard. The work will be finished in about 2 years. Ships of the Pakistani Navy have had to go to the British base at Malta for repairs.—News release.

PUERTO RICO

Jet Airline Service

The Puerto Rican Government is ready to lend an American airline part of the cost of three *Comet* jet airliners, provided two of them are placed on the New York-San Juan route, according to an announcement by the Director of the Economic Development Administration. If the negotiations are successful, the service would begin early in 1954.—News release.

BELGIUM

Rail Center Opened

Belgium recently inaugurated a new 60-million-dollar central station and railroad junction in the heart of Brussels—a project started 16 years ago. The still unfinished development includes tunnels under the heart of the city connecting the north-south and east-west branches of the Belgian railway system.—News release.

SWEDEN

Fighter Planes

The Swedish Air Force is selling 57 *Mustang* fighters. Israel will get 25 planes, and the Dominican Republic will get 32. The Swedish Air Force has stated that it does not need the planes because it is switching to jets.—News release.

Public Opinion Surveys

One out of four Swedes thinks Sweden should join the North Atlantic Treaty Organization while one out of two is against it, according to the latest public opinion surveys made in Sweden. About 62 percent of those polled rejected the belief that Sweden's neutrality policy would keep her out of a new world war, 22 percent voiced no opinion at all, and 16 percent believed Sweden could remain neutral.—News release.

NORWAY

Ultra High Frequency Transmissions

Norwegian broadcasting stations may switch to ultra high frequency transmissions, if tests indicate the practical possibilities of UHF in mountainous Norway.—Norwegian Information Service.

Balsa Wood Bullets

Balsa wood may be tried out in Norway for dummy bullets during Army exercises.

Several soldiers have been injured by the birch wood bullets now used. Experiments have been made with plastics and other materials in an effort to find "softer" ammunition.—News release.

USSR

Soviet Program Projects Tripling of Hydroelectric Power

A study of the new Soviet 5-year plan reveals that it contemplates the completion within little more than 3 years of five great new hydroelectric stations with an installed capacity of 4,016,000 kilowatts and the construction, probably by 1960, of six more enormous stations.

This program is designed to give the Soviet Union by 1955 a hydroelectric capacity three times greater than it had in 1950. It provides for the completion of the world's largest hydroelectric installation of 2,100,000 kilowatts at Kuibyshev on the Volga probably by 1954 and of an only slightly smaller 1,700,000 kilowatt plant at Stalingrad by 1956.

It provides for three or four more huge dams, each of which will be in a class with the famous Dnepr dam. It also provides for a start on the grandiose Angara River development in the Siberian heartlands, which is one of the world's richest hydroelectic potentials with, according to Soviet estimates, something like 9,000,000 kilowatts available for exploitation.

The projects scheduled for completion by 1955 include the Kuibyshev dam on the Volga, a dam at Molotov on the Kama River, a dam below Gorky on the Volga, the Mingechaur dam on the Kura River in Azerbaijan, and the Ust-Kamenogorsk plant on the Irtysh River.

Scheduled for somewhat later completion are the Stalingrad dam on the Volga, the Kakhovka dam on the lower Dnepr, the Cheboksary dam on the Volga, the Votkinsk dam on the Kama, and the Ust-Bukhtarma dam on the Irtysh River.

The total electric power production of this system is estimated at between 30 and 35 billion kilowatt hours a year or approximately the same as the total electric power production of Great Britain in 1938.—*The New York Times.*

The Soviet's projected power network includes dams at the points indicated by the symbols, as well as installations at unspecified sites in the Angara River area (marked by the cross). The total electric power production of this system is estimated at about 35 billion kilowatt hours a year, approximately the same as Britain's production in 1938.

YUGOSLAVIA

Diplomatic Relations

Japan and Yugoslavia have decided to establish normal diplomatic relations, according to an announcement by the Belgrade radio. The announcement stated that Japan soon would set up a legation in Belgrade, headed by a charge d'affaires. —News release.

COMMUNIST CHINA

Trade Agreement

Communist China has signed a trade agreement with Ceylon under which 80,000 tons of Chinese rice are scheduled to be exchanged for an undisclosed quantity of Ceylonese rubber and "other products."—*The New York Times.*

Aircraft Agreement

Chinese Nationalist military sources have reported that Communist China and the Soviet Union have concluded an agreement under which the Soviets will supply Communist China within a year with 1,500 *MiG-9s*, *MiG-15s*, and *Yaks*.

The sources said the agreement also provides for Soviet technical aid in building air bases and maintenance installations.—*The New York Times.*

BULGARIA

Industrial and Agricultural Production

Bulgaria's Premier recently stated that that country was almost a year ahead of its state plan targets for industrial and agricultural production.

The Premier said that the level of production aimed at for the end of the 5-year plan (December 1952) was reached in January 1952. He also claimed that new fields of production have opened up and the search for oil in some parts of Bulgaria has been successful. Moreover, a new field of industry has also been developed, including machine building, building materials, electrical construction, and a chemical industry.—News release.

AUSTRALIA

Radio Service

Canadian troops serving in Korea and Japan are receiving home news broadcasts from Australia. Because of technical difficulties, reception in Japan and Korea of Canadian broadcasts beamed direct is almost impossible. The reception from Australia is excellent, thereby providing the Canadians with news from home.—*Australian Weekly Review.*

Coal Production

Australian miners are producing all the coal that the country needs for everything except household gas making.

It is a dramatic change from Australia's previous coal situation. Australia has not exported coal, except to Pacific islands, for about 20 years, but she is now seeking overseas markets for steaming and coking coal.

Factors improving the situation include increased manpower, fewer strikes, and greater open-cut production.—News release.

Aid for Malaya

The Australian Government will provide assistance under the Colombo Plan for the Federation of Malaya's scheme to resettle 500,000 Chinese in 400 new villages in Malaya. The activity of terrorists necessitated the decision to transfer the Chinese from their scattered homes and resettle them in communities.—*Australian Weekly Review.*

Population Increase

Australia's population is now considerably in excess of 8,600,000, on the basis of the latest official figures released by the Federal statistician.

These showed that in the first quarter of 1952 the Nation's population rose by nearly 60,000 to a total of 8,589,000. Natural increase accounted for more than 32,000, migration a little under 28,000.—*Australian Weekly Review.*

FOREIGN MILITARY DIGESTS

The Soviet Attack in Depth

Translated and digested by the MILITARY REVIEW from an article by Brigadier General Gino Ferrari in "Revista Militare" (Italy) April 1952.

THE effectiveness of the methods adopted by the Soviets in their attacks in depth during the second half of the last war is well known. Therefore, it is worth while to examine their methods in order to attempt to deduce lessons from them.

In order to better understand the Soviet methods of attack in depth, it would be well to consider briefly the German defensive organization.

German Attitude

At first, the Germans in Russia paid little attention to the creation of powerful defense organizations, but when they found themselves forced to renounce their *blitzkrieg* tactics, they created powerful defensive systems made up of numerous successive positions, with multiple lines of trenches, strong points, defended localities, mined sectors protected by wire entanglements, and artillery barrages.

The average depth of each of the defensive positions was about 2 to 4 miles; the distance from one position to the other was about 2 to 3 miles; and the depth of the entire defense system was about 19 to 25 miles.

This was only a minimum depth for the defensive system, with increases in depth varying depending upon the situation. In the case of the defense of highway and railway centers, in particular, the defensive systems assumed much greater depths, at times from 40 to 70 miles.

Typical German Defenses

In order to understand more clearly the scope of the German defensive organizations, three typical examples are offered below:

Orel Salient

The Orel salient (a highway and railway junction point) was transformed by the Germans into a powerful fortified area in 22 months. The fortified area consisted of five defensive positions:

The first position consisted of multiple lines of trenches, protected by wire entanglements, camouflaged mine fields, and, between these, gun positions and shelters.

The second, or main, position consisted of an area of about 3 to 4 miles in depth, with interconnected centers of resistance, comprising steel cupolas for fire and observation. These cupolas were provided

with radio communication, ventilating systems, and periscopes. Moreover, inhabited localities and the wooded areas were transformed into supporting points for the cupolas.

The three other positions consisted of defended localities, which were supported by water courses, which were, in themselves, serious obstacles.

The total depth of the defensive system was about 40 to 50 miles.

Kharkov

The Kharkov region (a railway center) was transformed by the Germans into an immense fortified area. The city was protected, on the north, by successive positions; on the east, by the Donetz River and three successive positions. The defense positions were echeloned over some 55 miles in depth. In addition, there were two fortified zones (outer and inner zones) for the close-in defense of Kharkov:

The outer zone (5 to 9 miles from the city) was supported by inhabited localities. In the intervals between these, there were supporting points organized for all-round antitank defense, which were protected by mine fields, antitank ditches, and wire entanglements covering all approaches. The highways leading to Kharkov had been destroyed, the bridges demolished, and the areas in their vicinity mined.

The inner zone was supported by artillery and machine guns emplaced in factories and other buildings. The approaches to the city, which were mined, were blocked by barricades. The interior areas of the city were organized for street fighting.

Bobruisk

Bobruisk (a railway center) was covered, on the east, by five successive positions, separated from one another by a distance of from 8 to 19 miles. The total depth of the German defensive system was about 60 to 70 miles. The main position, which was the first zone, was 5 miles deep and consisted of five or six lines of interconnected trenches. There were also two fortified areas for the close-in defense of the city.

Effectiveness of German Defenses

However, in spite of these powerful defensive systems, the Germans were unable to halt the Soviet offensives, except for brief periods. It is true that the Germans quite often had insufficient reserves, and that many of the intermediate breaches were defended only with artillery fire, but these factors do not provide the principal reasons for the great Soviet successes.

At Orel, the Soviets went through the German defenses to a depth of nearly 45 miles in the course of a single week. At Kharkov, they broke through the German defense positions to a total depth of 56 miles in 20 days. At Bobruisk, the Soviets crossed the defense positions in 6 days.

Organization of the Attack

The Soviet attack in depth consisted of a break-through of the enemy defense system, and an encirclement in depth to destroy the enemy forces.

The penetration of the powerful German defense systems required the close cooperation of all arms and a deep echelonment of the attack disposition in order to facilitate uninterrupted effort.

Therefore, the organization of the attack had to be very accurate and highly detailed. When the necessary reconnaissance had been completed, and the required intelligence information compiled, the decision was made as to the number and types of forces required, the locations of the assembly and jumping-off positions, the itineraries to be followed, the methods of attack, and the organization of command and liaison. All of the officers who were to participate in the operation studied the terrain in detail by means of recon-

naissance, aerial photographs, and sand-table models. Moreover, all officers had to know the units and the missions of the other branches co-operating in the action, the hour of the attack, the signals for each particular action, the objectives, the directions of attack, the strengths of the attack units, the methods of liaison, and the forms of mutual understanding and co-operation, especially for requests for fire.

All these details were set down in a plan drawn up by the division staff, which was controlled by another so-called control plan.

Preparation Required

The success of the co-ordinated attack actions required a high degree of preparation on the part of the troops and the commanders. On this account, the attacks were not only discussed well in advance, but tactical exercises were conducted in detail on terrain similar to that of the actual operation. Such exercises lasted from a few days to several weeks. All branches which were to participate in the actual operation took part in the exercises, including infantry, tank, artillery, engineer, and air force units.

It was this minute preparation which facilitated the complex interplay of all the elements participating in the attack, and which, in many cases, made possible the successful application of the element of surprise.

Factor of Surprise

The preparations for the attack were carried out with secrecy in order to achieve surprise. All possible means were employed for maintaining secrecy concerning the concentration of forces. The approach to the attack positions was carried out with all caution, with strict discipline, and, generally, under the cover of darkness.

Assembly areas for the tanks were generally 25 to 30 miles behind the lines, with the tanks being brought forward to a waiting area (about 7 or 8 miles from the front), generally at night. The time that the tanks were to remain in the waiting areas had to be limited to a few hours. The itineraries which the tanks were to follow, and the crossings of these itineraries with those of other troops, were minutely worked out in order to achieve maximum speed and ensure that the various echelons arrived at the jumping-off positions at the proper time.

The artillery which was to take part in the attack was generally moved into position the night before the attack. The preparation of ammunition, reconnaissance of the areas, and survey work were carried out the day preceding the attack, with scrupulous care being taken to maintain secrecy concerning every preparation.

In addition to the maintenance of secrecy, the Soviets used various methods to deceive the enemy. One method used was that of requesting an artillery preparation over a broader sector than that of the attack, which made the enemy uncertain as to the point of main effort. Another method was that of requesting an artillery preparation, as though an attack were to be made, but without following it up with an attack. At times, this method was repeated the following day, but the preparation would be followed by an attack in another area that did not receive an artillery preparation.

The Soviets varied the time for the beginning of their attacks, depending upon the situation, but the attack at dawn, or a little before dawn, was the most common. The Soviets launched many large-scale night attacks toward the end of the war, but, because of the difficulty in controlling the actions of the tanks in darkness, such attacks were attempted only rarely, and under unusual circumstances. Attacks also were launched during the afternoon hours, but these were quite un-

common because, in the event of an enemy counterattack and a prolonged encounter requiring action during darkness, it was difficult to regroup and reorganize the forces.

Attack Procedure

At the end of the artillery preparation, the tanks and infantry attacked the first line of trenches, and, when these were captured, they rushed ahead to take the other successive lines of trenches. The first echelon continued this procedure until it was exhausted, and then the second echelon took over. The echelon following the attacking echelon mopped up the trenches that the attacking echelon had taken or passed, and eliminated any strong points remaining in the area. The mission of the first echelon was generally the capture of the initial or forward enemy positions, up to a depth of about 1 to 2 miles. The second echelon then continued the advance to the second positions, up to a depth of about 3 to 4 miles. Here, the second echelon was leap-frogged by another echelon which was expected to reach the third positions, up to a depth of about 8 to 9 miles. The echelons which had been leap-frogged were reorganized as a reserve for the attacking echelon. The various echelons continued this process until they achieved a complete break-through, reaching a depth of about 19 to 25 miles.

A Schematic Description

This is merely a schematic description of the Soviet attack procedure. The details differed in each case for, as was stated previously, the depth of the individual German positions, and the distances between them, varied for each particular defense area. However, it is useful because it shows that when one attack echelon was exhausted, or was about to reach the point of exhaustion, it was immediately leap-frogged by the following echelon in order to keep the enemy continually under attack until a break-through was effected. Furthermore, it illustrates the fact that the major mission of the attacking echelon was to penetrate rapidly in depth, and that the succeeding echelons took care of mopping up after the attacking echelon had passed.

Mutual Co-operation

One characteristic of the deep breakthroughs was that the attacking forces were obliged to conquer defense areas about which they had little information, and, at the same time, be prepared for any enemy counterattacks. The continual modification of the situation required initiative, rapid decision, improvisation, and close co-operation on the part of all troops. The main requirement in the co-operation of the various branches was reciprocal fire support. During the attacks, a certain number of tanks and self-propelled guns fought in close co-operation with even the smallest infantry units. The fire of the infantry was to protect the tanks, and to eliminate enemy antitank means. The tanks, in turn, were to combat the enemy's fire means which stood in the way of the advance of the infantry. The tanks were not to separate themselves from their own infantry, and were permitted to accept combat with enemy tanks only in cases of decided superiority on the part of the Soviet tanks. It was principally the artillery that was to combat the enemy tanks.

The close co-operation of the air force units also was of paramount importance. In cases of deep penetration, the airfields were echeloned in such a way that the Soviet aviation would always be able to maintain the air battle and support the ground forces.

As regards the co-operation of the artillery, the accompanying artillery was to combat the machine guns and the infantry weapons which stood in the way

of advancing Soviet troops, while the self-propelled guns were to protect the tanks and the infantry from the enemy antitank means and the counterattacks of the enemy tanks. Provision also was made to have a certain number of tanks and self-propelled guns accompany the various echelons to provide protection against possible flank attacks.

The infantry planes, during the break-through, operated in direct support of the infantry and the tanks along the principal axis of the attack. They were responsible for neutralizing the enemy fire system, destroying the enemy antitank pieces, frustrating counterattacks, and taking the place of the accompanying artillery if the latter was unable to keep up with the advance elements. The co-operation between the Soviet infantry and ground-support aircraft reached such a high degree of perfection that the planes were able to operate at distances only 220 to 330 yards ahead of the infantry.

Liaison

The close co-operation between all the elements participating in the attack could not have been realized without perfect liaison. Therefore, commanders of all elements and branches had to work in close contact with one another. They did not change their command posts for more advanced ones until liaison had been organized and effected, and elements had been left at the posts that they were abandoning. Such a system greatly facilitated the concentration of fires on the strong points which were to be eliminated, and on enemy preparations for a counter-attack.

Liaison between the infantry and artillery was maintained, for the most part, by means of pyrotechnic signals, while that between tanks and artillery was effected by means of radio and rocket.

Once the break-through was effected, tank units, motorized units, and masses of artillery rushed through the breach for action in the depths, while other troops attempted to widen the breach still more. The aim pursued was the encirclement of enemy masses in the case of co-ordinated break-throughs, or, in the case of a single break-through, to beat the retreating enemy to a river crossing, thereby permitting other units to complete the encirclement.

Supply Problems

The Soviet High Command was faced with a difficult task in supplying the troops engaged in attacks in depth. To burden the troops with heavy convoys was not advisable, which, moreover, would have been difficult, because of the relative scarcity of motorized means, nor was it advisable to depend on air supply alone. Generally, these difficulties were eliminated by the capture of German supplies.

Conclusions

1. The Soviets planned and organized their attacks in depth in minute detail. All personnel that participated in the action were oriented not only in the missions and the modes of action of their own units, but also in those of the units co-operating with them in the attack.

2. The attacks, in addition to being discussed in advance, were carried out as exercises of several days or weeks duration in order to ensure perfection in the actual operation.

3. Surprise was sought not only through the most rigorous secrecy concerning the preparations for the attack, but also through deception.

4. The attack formations were organized into various echelons, which were leap-frogged one over the other, in order to ensure an uninterrupted effort during the operation.

5. Co-operation and liaison between all elements were perfected to a high degree; a prerequisite for success in attacks in depth.

Air Warfare of the Future

Digested by the MILITARY REVIEW from an article by
Captain Norman Macmillan in "Aeronautics" (Great Britain) August 1952.

THE scientists' activities are leading us into four distinct fields of air war. These take the form of swept-wing and delta-wing aircraft manned by aircrews, robot expendable bombers, robot ramjet missiles, and long-range rocket missiles. All (except defense fighters) can be designed to carry atom bombs or atomic warheads, chemical explosives, fire bombs, or gas or bacterial contents.

Far-Reaching Influence

The scientists' efforts are affecting both defensive and offensive warfare. Sooner or later they are likely to affect the organization of the Air Force itself, for the increasingly scientific mechanization must modify the conception (hitherto fundamental) that an air force is a military organization produced, trained, and equipped to enable men to ascend into the air and use it as a medium for air-to-air combat, air-to-surface assault, reconnaissance, transportation, and as an auxiliary arm to surface forces.

Who Controls the Weapons?

Germany handed over the duties of antiaircraft artillery to her Air Force in the Hitler regime, but all other major states retained their antiaircraft artillery as an arm of their army, even when it came under the operational command of an air force commander. How, then, are robot missiles to be apportioned? Are those which operate at short range, and therefore may be likened to artillery, to become weapons of the Army, while those directed against long-range targets, which may be regarded as the equivalent of bombers, are allotted to the Air Force? Are they to be considered as projectiles or as aerodynes? Ought they to be divided into categories at all? Would it not be better to organize the manpower to suit the new weapons rather than endeavor to arrange the new weapons to fit the traditional division of military responsibilities? These are questions which must inevitably arise, and upon which Cabinet decisions must be made at some time, as was the case with naval aviation.

Before making any pronouncement on this problem, let us first consider the possible weapon developments of an air force, so far as they can be foreseen at present and (within the limits of security) stated.

In defensive air warfare, conventional guns are likely to be relegated for use at short range against low-altitude targets. The performance of even our present-day jet aircraft can carry them above the height to which the largest caliber antiaircraft gun can elevate its shells with speed and accuracy. Robot expendable bombers might or might not fly within their arc of fire, but ramjet and rocket missiles will fly far above it.

New methods of defense are, therefore, required to meet the developing conditions of possible air attack. These new methods may emerge under two categories, one directed by aircrews, and the other entirely robot but directed by ground crews during part of the airborne journey.

So long as conventional bombers (of whatever wing shape), flown by aircrews, are employed, it is a reasonable supposition that interceptor fighters flown by one or two men will be required, because however cunningly the robot may be contrived, it cannot possess the power of judgment possessed by the skilled, trained human pilot. The intercepting robot must begin its journey from the ground, and must start that journey in accordance with intelligence of a target received by its combination human-robot ground crew. The

manned interceptor, on the other hand, can be airborne in advance and in receipt of intelligence both from ground stations and from its own airborne radar or that of collaborating manned aircraft. Indeed, it is possible to conceive of conditions which would demand the maintenance of an airborne detector system flown by aircrews in order that intelligence may be received a sufficient time in advance of an onslaught, either by manned bombers or robot missiles, to make it possible for defense of any kind to operate efficiently. Such a condition might arise if the United Kingdom were again to be isolated as it was in 1940.

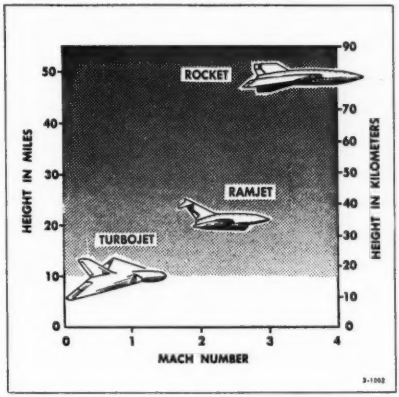
Manned Interceptor Fighters

Certainly manned interceptor fighters will continue to be developed with ever increasing jet-engine power until a single interceptor may have the equivalent of 50,000 horsepower built into it in jet thrust without boost injection or reheat. These interceptors will be radar equipped for long-range detection, carry electronic sights with automatic firing, and will discharge ultrasupersonic self-homing missiles whose proximity fuzes will detonate charges of greater lethal radius than any hitherto used by interceptors. These they will discharge at long range. For closer engagement, they will also carry small batteries of relatively large-caliber guns. They can thus be likened to naval ships, which have long carried both primary and secondary armament.

A Chapter From Science Fiction

The aircrews flying these interceptors will be enclosed in pressurized cabins, will breathe oxygen, and wear pressure suits to ensure oxygenation at great heights and ensure their safety if their pressurized cabins should be punctured in combat. They may have to wear special breathing sweat suits next to their skin to provide a proper balance of body temperature, and they will certainly wear g-suits to enable them to withstand the enormous centrifugal loads of maneuvering at supersonic speeds. They may have to accept a prone position instead of a sitting posture in the aircraft to accommodate their bodies best to the newer designs of aircraft. In this case, the normal aircraft controls which have hitherto been seen in cockpits may have to be radically altered to suit the altered installation of the pilot.

Their cabins will be warmed with hot air tapped from the jet compressor when on or near the ground in cold weather,



This diagram shows the regions, both of altitude and speed, in which the three new types of power plants—turbojet, ramjet, and rocket—may be exploited in warfare.

and cooled with refrigerated air when flying at high speed when skin friction of the air can raise the temperature of the metal to 100 degrees centigrade, and when at great heights the cosmic radiation can raise the temperature still higher. They will sit in ejector seats, or lie on ejector stretchers, by which they can be shot out of the aircraft like a shell from a gun.

Amid the acrid fumes of the cartridge powder they will shoot into the thin air carrying their own special emergency supply of oxygen, a parachute will open to

slow down their momentum, the seat or stretcher will float away on this canopy and the man will plunge down through the stratosphere breathing his emergency oxygen as he falls until at a reasonable height he pulls the ripcord of his personal parachute (or a mechanical valve does it for him) and floats to earth with the slow swinging motion of the braked descent.

It seems almost incredible that men can be asked to operate under such conditions of artificiality. However, today we are on the verge of them, and some of the conditions described are already operative. The others will be accepted by young men as part of the normal duties of military aviation, with themselves the spawning plasma of the scientist who makes their bizarre career a reality.

We are indeed near the possibility that the aluminum of the leading edges of aircraft wings might become so hot with the combination of air friction and cosmic radiation as almost to reach the melting point, so that either the leading edges of the wings must be cooled at great heights and speeds or some different metal with a higher melting point—such as titanium—be used for that part of the wing. While lower down, when passing through the damp atmosphere, the leading edges must be warmed by thermal airflow tapped from the jet engine in order to prevent ice forming and distorting the wing shape.

All these different and often conflicting conditions can be overcome by ingenious means, and these interceptors, operating in conjunction with the ground control organization, will be valuable defense weapons against manned aircraft (whether fighters, bombers, or reconnaissance types) and expendable bombers equipped with turbojet engines.

They may have to be flown at any height between 50,000 and 60,000 feet. That is the snag, for the jet engine aircraft develops its efficiency according to the Newtonian law that action and reaction are equal and opposite. At 60,000 feet the atmosphere has but one-tenth the density found at 50 feet. The power required to push an aircraft through the dense lower air is far greater than that required to push it through the thin air of the stratosphere. In consequence, near the ground the engine burns three times the quantity of fuel, undergoes most heat and stress, yet the aircraft's speed is hardly any faster, and may, indeed, be slower. The aircraft's duration and range fall. Does this mean that there is a soft spot in the defense?

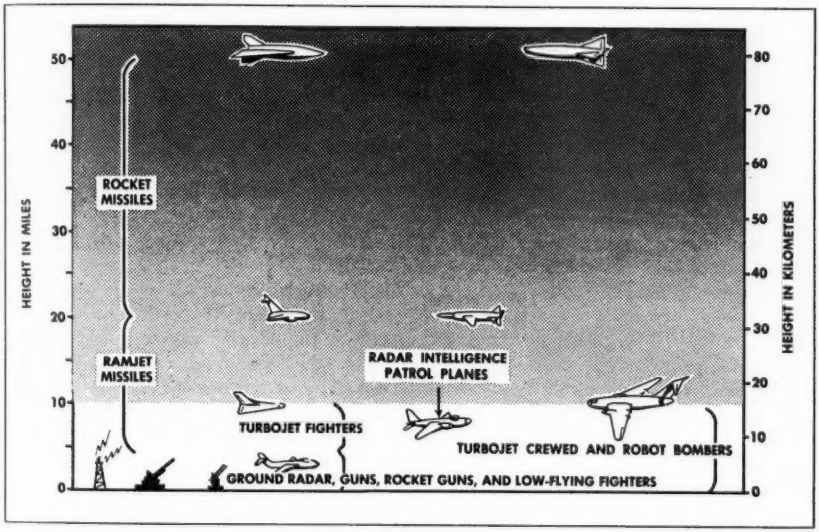
Radar Required

The ground antiaircraft reporting and control organization depends largely on radar for advance intelligence. Long-range radar impulses and echoes travel in straight lines. They do not bend round the horizon, and so provide intelligence only of aircraft or missiles flying above the horizon of the radar transmitter. Aircraft or missiles approaching at a continuous height above the curved surface of the earth do not follow a straight path in the vertical plane, and they enter the detection zone of a given radar station only when they emerge above that station's horizon. Hence, the lowest flying attacker avoids detection until the last possible moment. For that reason, this form of attack is theoretically the most dangerous in the eyes of a defense commander. It gives him the least time and air space in which to counter the attack. Against it he can deploy guns (including rocket guns) and interceptor fighters. However, the attacker passes through the fore-and-aft firing arc of the gun-line in the shortest possible time, and, in consequence, the gun-belt must be multiplied in depth to increase its efficiency, with a resulting upsurge in industrial and military manpower (and high priority materials) allocated to this purely static defense effort.

Against this form of attack, how can the defense commander scramble his interceptors off when his time of warning is so short? How can he maintain a standing patrol when his fighters' duration at low altitude is so brief?

We must not delude ourselves by the report that on 17 March 1952 two United States Air Force *Thunderjet* fighters based in Germany flew 2,800 miles in 4 hours and 48 minutes of sustained flight, carrying additional fuel in extra tanks, for no doubt this flight was made at or near the best operating height. At ground level, their duration would have been reduced to 1½ to 2 hours and their top speed would have been no greater than the 585 miles an hour stated in the report; and, with the extra tanks' additional drag at low altitude, the speed might well have been less.

When we consider future interceptor jet fighters (of far greater power than *Thunderjets*) the problem of fuel becomes acute. Even single-engine turbojet interceptors may consume from 1,250 to 2,500 gallons hourly when flying fast at low altitude, and the provision of fuel in quantities of this kind becomes a problem of bulk storage in an aircraft whose conception is anti-belly in outline, and whose wings must be thin to attain high speed.



This diagram illustrates the respective height zones in which the various kinds of aircraft or missiles can be expected to operate in future warfare. The defense may use ground artillery, manned fighters, ramjets, or rocket missiles, according to the altitude of the attack. The attack may use manned bombers, the ramjets, or the rocket missiles.

Here it appears that the answer may be found in flight refueling. By this means, fighters can be kept airborne almost indefinitely. A *Meteor* has been kept aloft for 12 hours, refueling in flight 10 times. I believe the jet fighter duration record is more than 14 hours using refueling facilities in flight. A tanker has been built which can refuel three fighters simultaneously, and one such tanker is capable of maintaining a squadron of 12 fighters in continuous flight. This method

of increasing fighter utilization seems to provide the defense commander with the answer to his problem of ranging the interceptor against the bomber at all altitudes with the greatest prospect of achieving success. Certainly it introduces another link in the organization of fighter defense, but there appears to be no special difficulty in making it operative if the problems involved are tackled properly. The tankers can be flown by less highly trained aircrews than the fighters, or by older men less physically fit to stand the strains of combat flying, or by aircrews during respite from operational tours, or, even, if necessary, by women. By raising the utilization factor of the fighters, defense cover could be provided by a smaller first-line force, so meeting the two military requirements of concentration and conservation of fighting power.

Low-Altitude Interception

If the defense could afford to provide an interceptor for low-altitude interception only, the aircraft could be greatly simplified in equipment, for it would not need the combinations of protection for the pilot to protect him from all the conditions referred to earlier in this article. However, it should be able to operate by day or night, and, to provide for the high factor of utilization, the crews should exceed the aircraft in number to the required proportion.

High-Altitude Interception

Defense against high-altitude attack will certainly demand the use of manned interceptor fighters while crewed or uncrewed turbojet bombers are employed. However, defense against high-altitude attack can be strengthened more effectively than against low-altitude attack, and it may be that at the high levels the use of crewed interceptors will only continue during a transition period, which may last for the next 10 or 20 years. During this period, high-altitude interceptors can also gain from flight refueling, because both during climb and descent the high flying fighter burns up fuel and so curtails its duration. Moreover, by refueling in flight instead of on the ground, part of the complication of fighter control—their turnover to airfield flight control instead of combat control—can be avoided, for combat control should be made operationally responsible for airborne refueling and for giving any required assistance from the ground to ensure interception between tanker aircraft and fighters.

Ramjets and Rockets

Ramjet missiles and rockets will certainly be developed and employed for high-altitude interception. Both can be likened to self-propelled shells. Both have to be discharged by some form of launching device carrying booster units to give the missiles a high initial acceleration; the launching device will automatically be jettisoned when its usefulness has ceased. Presumably, when used for land defense, the launching devices will have self-opening parachutes to break their fall, so that they will not cause unnecessary surface damage, and may be recovered intact for another launching.

Ramjets burn ordinary fuel and rely on atmospheric oxygen for their combustion. They obtain oxygen from the ram effect of their own passage through the air. Two conditions limit the supply of oxygen, and, hence, a ramjet's performance, one being its own speed, and the other the density of the atmosphere. The greatest height at which they are likely to operate is about 90,000 to 100,000 feet, for above that height in the attenuated atmosphere the molecules of air spread so far apart that the ramjet takes them in intermittently instead of in a continuous stream; its power then falls, its combustion temperature drops, and the flame may even die out. Up to that height, the speed of ramjets appears to be limited

by their own peculiarities to about twice the speed of sound or perhaps a little more.

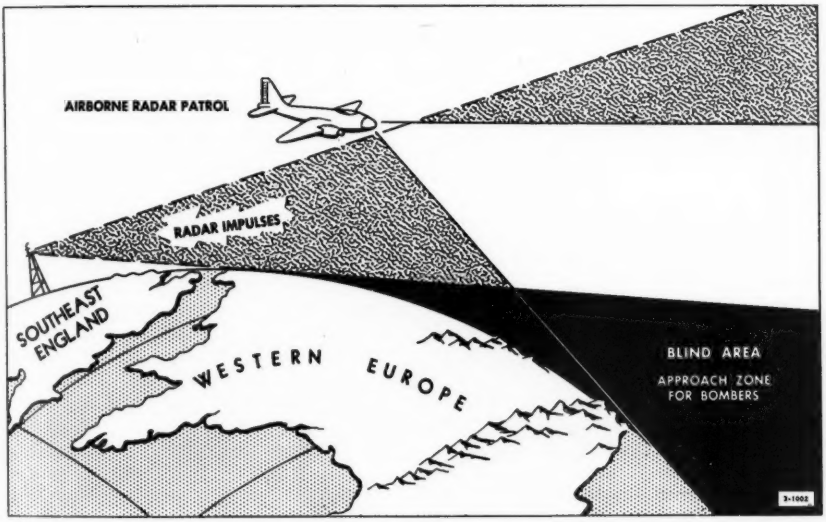
The rocket carries its own fuel and provides for its own combustion. The limit of height it can reach is dependent upon the punch built into it. In theory, it can defeat the gravitational pull of the earth and pass out of the earth's orbit into outer space. However, for practical foreseeable purposes, we can say its velocity is about four times the speed of sound and its operational height perhaps 200,000 to 250,000 feet.

Interceptor fighters are, therefore, valueless against ramjet and rocket attacks which may be from two to four times greater in speed than the fighter, and may fly much higher than the fighter can reach.

Defense against air attack thus falls into four vertical zones:

1. Guns and small rockets fired from the ground from ground level up to, say, 20,000 feet.
2. Interceptor fighters from ground level up to 60,000 feet.
3. Ramjet missiles from about 20,000 to 90,000 feet.
4. Large rockets from 50,000 to 250,000 feet.

An attacker flying at 20,000 feet is detectable at a sufficient distance to give time to deploy the defenses, provided the fighters are airborne. Interceptor fighters could form the outermost defense ring against bombers coming in at such a height, for the fighters could fly much higher and be in continuous touch with ground combat control and be directed into combat the instant the incoming force was detected on the radar screen. Ramjet-guided missiles could not be launched until the incoming force was detected



Unless a firm foothold can be maintained in Western Europe, Britain's early warning radar system will be limited by her coast line. If radar bases cannot be maintained in Europe, then they must be carried forward in ships or upward in aircraft, for the curvature of the earth limits the range of the straight-line radiation of the short wave radar sets.

and had continued its flight to a point where the electronic beam directing the ramjet could be elevated sufficiently above the horizon to ensure freedom from ground interference.

Obviously, any plan of enemy attack would take these factors into consideration. The enemy commander should be aware of the distance gradient along which his aircraft could be detected by the defending radar screen, and at what point above it his aircraft would begin to come under ramjet missile fire from the ground. He would, therefore, so arrange his flight plan that his attacking aircraft would be briefed to reduce height to keep just below the radar gradient, and so avoid until the last possible moment the risk of guided missiles fired from the ground.

Every addition in attack height above the radar gradient must lengthen the range of possible detection, provided the attack force has not taken action to blind, confuse, or deceive the radar defenses, as the Royal Air Force Bomber Command so successfully did toward the end of the last war. Unless flight planning of this nature or radar blinding is successfully used by the attack force, all its crewed and expendable bombers can be brought under the fire of at least two, and perhaps three, of the available forms of dynamic air defense.

If one assumes that the battle line will lie just below the radar gradient, it is apparent that the highest altitude interceptors will be required to operate at the greatest distance from the defense ground combat control, and that the inner ring of defense will be forced to rely upon the strength and efficiency of the low-altitude interceptor force against any attack force coming in below the radar gradient; for the operation against them of guided missiles from the ground is impossible so long as the attackers remain below that gradient.

Quite clearly, a country with a mountain frontier is more happily placed in respect of modern air defense than one whose frontier is low-lying.

Air and Water Radar Posts

Today the sea serves the airborne enemy unless radar posts are established upon the waters, or on land or in the air above them, which will reduce the height of the radar gradient, and bring the lower flying attackers within radar detection at greater range, so that guided missiles can be used against them from the sea, the air above it, or the forward land area. Only then can it be assumed that all crewed and expendable bombers can be brought under the fire of at least two, and perhaps three, of the available forms of dynamic air defense. It is apparent that the human-crewed, low-altitude interceptor, with its own self-contained intelligence, will be, and must continue to be, a vital part of the defense, and that its chief requirement is increase of range without loss of performance, a factor which, as we have seen, is obtainable only by the properly integrated use of flight refueling.

High-Altitude Warfare

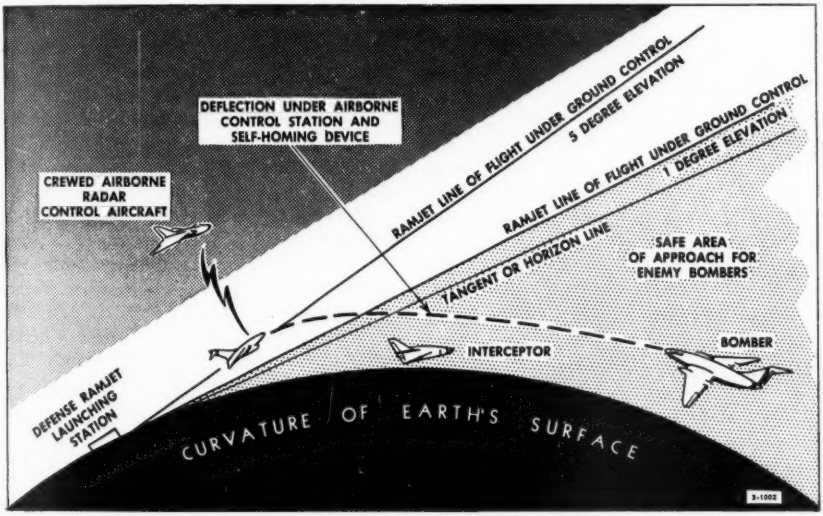
Ramjet and rocket attacks fall into another category. During most of their flight they will travel high above the reach of ground guns and interceptor fighters. Owing to their height of flight, they can be detected at greater range. Moreover, they are far less likely to be shielded by radar jamming. However, their faster speed shortens the time available to deploy defense against them. When flying high, their only foes are rockets and ramjets designed to home on them. Here is a fantastic picture of a war in the air where robot missiles converge along different parabolic flight paths until they meet somewhere between 15 to 20 miles above the earth's surface, and shatter like colliding meteorites. If the

attacking robot carries an atomic warhead the illumination of its disintegrating end may flame into incandescence like the bursting of a nova in outer space.

Preparedness the Best Defense

Whether a future air war (if it ever comes) will take one form or another or all forms simultaneously, no one can predict with any certainty. The only sure action to take is to prepare to meet and use all forms both for defense and offense. Then, perhaps, the age-old principle of the "fleet-in-being" may deter both antagonists from employing their most deadly and dangerously penetrative weapons. However, it is a delusive thought to believe that the "fleet-in-being" can absolutely prevent war from beginning; history records such prevention only when the policies at issue have not been of sufficient importance to stake them on the arbitrament of war; when they have been so important, the instrument of war has been wielded as the weapon of policy all through the centuries. In reference to the American Civil War, President Lincoln said in his second inaugural address on 4 March 1865: "Both parties deprecated war; but one of them would make war rather than let the Nation survive, and the other would accept war rather than let it perish. And the war came."

There are those who believe that ultra-scientific warfare is just around the corner. They say that before long all crewed bombers will be replaced by expendable bombers which will be cheaper to make; and that, as these expendable bombers will have only the outward journey to make (as did the *V-1*), their range can equal or exceed that of the equivalent crewed bomber which must


DEFLECTION UNDER AIRBORNE CONTROL STATION AND SELF-HOMING DEVICE
CREWED AIRBORNE RADAR CONTROL AIRCRAFT
RAMJET LINE OF FLIGHT UNDER GROUND CONTROL 5 DEGREE ELEVATION
RAMJET LINE OF FLIGHT UNDER GROUND CONTROL 1 DEGREE ELEVATION
TANGENT OR HORIZON LINE
SAFE AREA OF APPROACH FOR ENEMY BOMBERS
INTERCEPTOR
BOMBER
DEFENSE RAMJET LAUNCHING STATION
CURVATURE OF EARTH'S SURFACE
3-1002

If the ramjet fighter is launched under the direction of ground based radar, the line-of-sight coverage available to control the plane will leave an open approach to the low-flying bomber. One solution to the problem is to use airborne radar stations whose sets can "see" over the horizon and direct the ramjet fighter on to the approaching bomber.

carry fuel for the return journey also; but this does not apply if the crewed bomber is flight refueled. It is suggested that expendable bombers will self-navigate with sufficient accuracy to take them to their targets at long range by orientation on the earth's magnetic field or relative to the heavenly bodies. When near their target areas, they may be designed to home toward some given special objective, and get near enough by means of the robot brain to do serious damage, especially if equipped with atomic warheads.

The unwinged ramjet or rocket will have a shorter range than the turbojet expendable bomber; but a ramjet or rocket fitted with wings might extend its range to equal or perhaps exceed the expendable bomber's range; so it is necessary to visualize the possibility of all three forms of weapon being used for bombardment at long range; but it is most unlikely that this stage of their development will be reached coincidentally.

I believe it is impossible to predict at the present moment when it may become feasible to use "push-button" war strategically with tactical accuracy, but there seems every likelihood that it will eventually be both possible and practicable if the peoples of the world are prepared to turn themselves into slaves to work to this end and give up many other far more desirable things which civilization can offer to a peaceful world.

At the present moment, we are at the opening of the transitional stage in air war weapon development. The *V-1* and *V-2* pointed the way, and marked the beginning of a new military epoch. The pulse-reactor power unit of the *V-1* will be replaced by turbojets and ramjets. The rocket motor of the *V-2* will be developed to more powerful forms.

In consequence, it is held by some minds that future aviation will fall into two broad classes, defined as military and transport. It is probable (as far as can be foreseen at the moment and without access to any secrets) that atomic power when applied to aircraft will be more likely to be used in what would be called the transport class. This type of aircraft, having great duration and carrying power, could act as a battleship of the air, equipped with guided missiles fitted with atomic warheads. It could cruise to any position on the earth's surface, and, if not destroyed or disabled, discharge its guided weapons against almost any target. It might basically be of flying-boat design, and, indeed, most probably would use water for landing areas rather than still larger and more costly airfields on the land areas. Unless the world's political problems can be resolved by means other than war before these developments take actionable shape, we shall have arrived at the time when intercontinental air warfare will have become a reality. Aircraft will cruise over both continents and oceans with the ease and assurance hitherto known only in sea-going fleets, and will dominate the land masses as the oceans have been scenes of contest and domination in the past.

During the transitional period upon which we have already entered, many problems will have to be decided. With the continued military development away from human- to robot-controlled air weapons, the question of allocation of responsibility for their operational employment must certainly arise. No doubt this is a subject which has already received consideration, and must continue to receive further consideration with each progressive change.

The RAF's Responsibility

Which part of the scientific warfare of the future will best be handled by the Royal Air Force?

It seems reasonable to assume that United Kingdom air defense will continue to be the responsibility of the Royal Air

Force, for problems of long-range radar are probably more highly developed by this service than any other. Moreover, the strategic weapons to be countered would probably have features in common with those developed by British experts, and the service which was charged with the development and operation of such weapons would be best fitted to organize the defense against those of an enemy.

Expendable bombers and long-range ramjets involve aerodynamic problems in their design and construction, and would require an organization similar to the control and reporting section of the Royal Air Force for their operation, so here again it appears that responsibility should be placed upon the Royal Air Force.

The Army's Responsibility

The Army would continue to possess its antiaircraft command, operating guns against the low-flying attackers, and using short-range guided weapons for the same purpose. As we have seen already postulated above, it is possible that these guided weapons in the antiaircraft command would be located at stations within the outer defense zone, and perhaps even with the inner defense zone itself. The guided weapons used against attackers at a greater distance may have to be an Air Force responsibility, because Air Force mobility alone might make it possible to deploy them. On the ground, this might become a function of the Royal Air Force Regiment; in the air (for air-to-air guided weapons) it would be a function of the Fighter Command. Thus, as between Army and Air Force, range of attack appears to be the guiding principle for demarcation of responsibility.

The Navy's Responsibility

The Navy will certainly have the responsibility of operating guided weapons for offense and defense from ships, and, by making use of ship-borne aircraft to guide the weapons, may be able to direct a formidable bombardment against an enemy coastal zone from a position where its own ships will be below the radar horizon and so out of radar view. These guided missiles could be discharged to change course in flight toward their targets, thus deceiving the defense as to the direction from where they came, and so providing strategic cover for the fleet concerned. The development of ramjet and rocket guided and self-homing missiles will give fleets greater protection against air attack than they enjoyed during the last war, and it is, therefore, probable that their greatest enemy will be the submarine and not the airplane. There appears no reason why the submarine of the future should not be able to use torpedoes or mines carrying atomic explosives against both fleets and convoys, and this is likely to have a marked effect on the organization of sea-going stations in war.

Owing to the nature of the problem, it appears to be desirable to allocate all shore defense against air attack to one authority, and that all shore stations and ports should come under one operational command, which should most properly be the responsibility of the Air Force, with both Army and Navy units operating under one supreme commander in chief.

So far as the British Isles are concerned, it has always been regarded as a disadvantage that we are so crowded, and all our industries and defense stations so concentrated within a relatively small area. However, with the expanding power of defense, which at this moment appears to be overtaking the lead recently held by offense in the air, it may even prove that concentration is not such a disadvantage after all. The attacking weapons must come in over more readily plottable flight paths, and the total volume of defense organization required to deal with them can be concentrated in the relatively small area. Admittedly, if the defense is pene-

trated, the concentration of population, industry, and installations is a weakness, but the ability to concentrate defense forces is a source of strength.

During the transitional period of development, fighters and guided weapons, and bombers and expendable bombers (of all classes), will continue in use. Thus will continue for many years to come the need for a specialist air force, and because of their own inherent specialist values, there is no likelihood of the three services being telescoped into one. The air force is now the premier service in defense and offense; this position is likely to continue unchanged for many years to come. And, if the world does not change its ways, and eschew war altogether, it seems probable that the future air force will be an attack, defense, and air-transport force, the future navy a sea-carrying force, and the future army an occupying force. If the weapons are produced which are possible of development, the warfare of the future may become a long-range shooting war, with atomic guided weapons. After a country has been sufficiently shot to pieces, the army would move in as an occupational force transported by sea and air transport. This would be a scientific return to the ancient methods of knocking down the castle!

Industry and Warfare

Experience of what happened to Germany under air bombardment in the last war indicates that with certain elements of industry struck out by long-range bombardment, no nation can maintain a war when fighting forces are dependent upon organized industrialization. Although in Germany's case her war effort was directed mainly toward her Army, the same principle holds in relation to any fighting force, and no air force could long survive the absence in its industrial support of vital components. Victory in future war may, therefore, depend upon relative efficiency in combined air defense and attack, efficiency of intelligence of the enemy industrialization (its weakest links and where they are sited), and a sufficient stock-piling of the essential elements of one's own industrialization in advance of war so that the assembly of the finished weapon could not be held up for lack of an essential key part.

Continuous Readiness Essential

The indication is that every state must now be continuously prepared for war. There can be no return (in present conditions) to the former British policy of relying upon defense to provide time to build up after war began. Moreover, it is apparent that the increasing scientific form of warfare will continue to add to its cost, and to the burden which every state must bear to maintain itself in a condition of continuous readiness. This is an economic position which can hardly persist indefinitely, for if it does the entire world will be bankrupted in the process, and all mankind will be the poorer, even without war.

Whether the Western allies can attain sufficient political strength through the present policy of rearming to enable the great world states to arrive at some compromise which will prevent war is not in their hands alone. The world is no more stable than was the United States at the time of which Abraham Lincoln spoke when he used the words—"And the war came"—which I have quoted above.

The Source of Military Morale

Digested by the MILITARY REVIEW from an article by
Lieutenant Colonel L. J. Loughran in the "Australian Army Journal" January 1952.

The true strength of any army lies in its moral character and the spirit of its soldiers. A man needs a sense of individual dignity and responsibility. He must know and believe in the ideals of his country and he must be willing to protect and perpetuate them.—General J. Lawton Collins.

TOTAL war has brought with it an increasing realization that the morale of military forces must have a broader and deeper base than in the past. Among the eminent soldiers who have expressed this opinion is General J. Lawton Collins, Chief of Staff of the United States Army, whose statement of the requirement is quoted above.

In this article, I propose to examine General Collins' statement, with particular reference to the problem of creating and maintaining in the Australian Army a morale which will carry it through any undertaking, no matter how hazardous or prolonged, in the decisive struggle to which the Western world is deeply committed.

Although we sometimes refer to a man as a "born soldier," no man is born a soldier. For the first, character-forming years of his life, he is a civilian—acknowledging no discipline but that common to other civilians of his age and state. In his family circle, he acquires his first vague philosophy of life and, in general, it is this initial philosophy, developed and adjusted by environment, that persists into manhood.

The Army, then, fills its ranks with civilians whose ideals have already in large measure been determined. So long as a man is not subversive, is physically fit, and, theoretically, has reached the mental age of at least 11 years, he can be enlisted. He can be atheist or theist, radical or reactionary, and moral or immoral. He can come from farm or factory, school or shop—and with him he brings his little world of dreams and ideas and, if he has any, ideals.

The task of the Army is to fashion this hotchpotch of humanity into an efficient fighting machine, which means a machine that not only *can* fight but one that *will* fight. We can train an army until it is perfection itself amidst the blank cartridges and flour bombs, but can we train one that will function as flawlessly when death stalks every stride? And, quite apart from military training, can we produce a body of men who will tolerate the mental strain not of one or two short and vigorous campaigns, but an extended affair lasting many years or perhaps even a lifetime?

The Will to Fight and Win

An army quite obviously needs something other than the mere ability to maneuver, to use its weapons to the best possible advantage, to cope with its supply problems, and to sustain long drawn out physical effort. Those things are important, certainly, but the vital, the decisive, factor is the *will* to fight and win.

Although the subject of this article supplies the reputed answer to the question of what gives an army the will to fight and win, considerable elaboration is required before we can decide intelligently just how it is to be applied to our own Army. What, for example, are the ideals of his country that the Australian soldier must know and believe in? What exactly is meant by "a sense of individual dignity and responsibility"? What factors determine moral character?

It is abundantly clear that no army will have the will to fight and win unless it is sustained and encouraged by the *nation* —unless, that is, the *nation* has the will to fight and win. There are various motives for which nations will go to war, but the intensity and endurance with which a war is fought depend on one quality—the patriotism of the people. The abuse and over use of this word must not blind us to the fact that it has a definite meaning —the love of and the desire to serve one's country.

It is important to note that there are two different types of patriotism having, it is true, certain features in common but otherwise differing greatly. The first of these is the pagan patriotism of the pre-Christian era, which has been revived in modern times by Italy, Germany, Japan, and the Soviet Union. The second is the Christian concept of national patriotism on which Western civilization was nourished.

We must know the distinction between these two if we are to understand the spiritual forces which activate the various peoples of the world and if we are to harness these forces for our own use.

Pagan Patriotism

Patriotism, considered solely in the pagan or material sense, has always been the best medicine of humanity and all the sterner and more robust virtues were matured to the highest degree by its power. More than any other influence, it diffuses a steady fortitude that is equally removed from languor and timidity on the one hand and from feverish and morbid excitement on the other. It produces a capacity for united action, for self-sacrifice, for long and persevering exertion—an ability to pass through life with majestic dignity and to meet death with unfaltering calm. Almost all those examples of heroic self-sacrifice which antiquity affords were produced by the spirit of patriotism. It pervaded all classes not only in times of national crisis but habitually. It formed a distinct type of character and was the origin both of many virtues and many vices.

This picture of the brighter side of patriotism, however, looks gloomy in reverse. The Roman civilization, for example, exhibited the sterner virtues in abundance, but it was notoriously deficient in the gentler ones. The pathos of life was invariably repressed. Suffering and weakness met with little sympathy or assistance. The slave, the captive, the sick, and the helpless were treated with cold indifference or with the most cold-blooded ferocity. Hospitals and refuges for the afflicted were unknown. The spectacle of suffering and death was the luxury of all classes. An almost absolute destruction of the finer sensibilities was the consequence of the universal worship of force. The welfare of the state being the highest object of unselfish devotion, vice and virtue were often measured by that standard and the individual was habitually sacrificed to the community.

However, perhaps the greatest vice of the old form of patriotism was the narrowness of sympathy which it produced. Outside the circle of their own nation, men were regarded with contempt and indifference, if not with absolute hostility. Conquest was the one recognized form of national progress and the interests of nations were, therefore, regarded as directly opposed. The intensity with which a man loved his country was a measure of the hatred he bore to those outside it.

This, then, is the pagan patriotism which we have seen mirrored in our own time by Italy, Germany, Japan, and the Soviet Union. Its most noteworthy feature is the subjugation of the individual to the state.

It is easy to see that the history of mankind has turned a full circle from the tribalism of savagery around and back to the nationalistic tribalism of the modern world.

Christian Patriotism

The Christian concept of national patriotism stems from two basic postulates —the primacy of the individual personality and the essential unity of the human race.

To the Christian, man is not merely a material being; every man has a soul individually created by God and his destiny is partly in time, partly in eternity.

To help man to reach his destined end, he possesses certain faculties and exigencies, both material and spiritual. To emphasize one of these to the exclusion of the other does violence to his nature and leads to disaster.

Among the aids which God has provided to enable man to achieve his destiny is society, that is, the association of free human beings who need each other to get goods, satisfactions, and the full development of their personalities which they cannot achieve in isolation.

The society a man lives in, together with the soil it occupies, constitutes his fatherland and, because of its contribution to his existence and development, he owes it, in justice, a debt of gratitude.

Every citizen, therefore, has an obligation to love in a special way and to render a special service to his country and to his fellow citizens who live under the same flag or belong to the same nation. This is the Christian concept of national patriotism.

It will be noted that the Christian's debt to society derives from the fact that society helps *him* to achieve *his* destiny. The pagan (or modern extreme nationalist) concept, by contrast, holds that the state is the supreme good and that the individual exists only to help the state to fulfill *its* destiny. To some this might appear to be mere quibbling with words, but, philosophically, the two concepts are poles apart and, in their pure forms, mean precisely the difference between freedom and slavery.

I have made this comparison between the pagan patriotism of the pre-Christian era (revived in modern nationalism) and the Christian concept of patriotism (on which Western civilization grew) to show the choice of ideals which lies before us, because the time is at hand when we must choose.

As a nation we have lost, as I shall show later, what ideals we once had. We are coasting uphill on a past impetus and our pace is getting slower and slower.

Perhaps nothing demonstrates our negativism more clearly than our fear of our ideological enemies. This is true not only of Australia, but of Western civilization generally. Whenever men fall into Soviet hands we fear, not without reason, that they will be contaminated by Communist ideology—that they will become loyal servants of the Soviet Union. Yet, in similar circumstances, we fear our own inability to imbue others with our ideals, simply because we have none. Our Christian ethics are a legacy from our Christian ancestors and we are fast letting them die for want of nourishment.

There are many good men who, while possessing no conscious religious feeling, are nevertheless rich in Christian virtues. They appear to think that a sense of fair play, a helping hand to the weak, a sense of honesty, and a high moral code generally are characteristics of their race—a sort of natural endowment. To be sure they know that way back their ancestors were barbarians, but they never trouble to study the influences that transformed those barbarians into such good fellows as themselves.

It is no secret, of course, that the code of ethics which grew with Western civilization has its roots in Christianity. What is not generally realized, however, is that a decline in Christianity means a decline in our moral values, and the death of Christianity would mean the end of our moral code.

The Australian Scene

We have seen that the spirit of an army depends, to a great extent, on the spirit of the nation. We have seen, furthermore, that the soldier is, first and foremost, a civilian and that he reflects the feelings and ideals of the community. Especially is this true of the peacetime citizen soldier who comes under the influence of the Army for comparatively few hours each year.

It must be apparent, therefore, that a soldier can only "know and believe in the ideals of his country and be willing to protect and perpetuate them" if his country has ideals which it deems worth preserving and, if necessary, worth fighting for.

Since a nation, in the Christian concept, is the popular community of free human persons, the ideals of a nation can only be the sum total of the ideals of its inhabitants. Australia, as we well know, is nearly equally divided on political ideals, so we must find some other common ground if we are going to get the unanimity necessary for an all-out effort.

Have we had any common ideal in the past in this country? If so, have we one now?

For a long time our national ideal derived from the land itself and its location. The folk who pioneered our continent made a long and dangerous journey to face unknown hazards. They were knit together by the knowledge of their isolation and their complete dependence on each other. They found their ideal in accepting the challenge of a vast, primeval wilderness, which, side by side, they gradually subdued and conquered.

In course of time, the discovery of gold, the growth of population, and a wider appreciation of the potentialities of the country gave rise to a feeling of nationhood.

With these growing pains, as is often the case, there came a feeling of arrogance—a desire to prove to others that we were as good as they. After World War I, we had proved it to our own satisfaction and we hoped that others were duly impressed. Our ideal of independent nationalism had been achieved and tested in fire. However, now, instead of looking forward, we looked back and contented ourselves with contemplating our past. Our nationalism began to show itself as almost completely negative, expressing itself in terms of what we dislike both with respect to foreigners and even to our own.

Between the two world wars, Australians were subjected to a barrage of extreme pacificism and exaggerated internationalism, spread by left-wing propaganda. A truly Christian nation would have withstood this onslaught because Christianity, while stressing the equality of man in essential human nature and fundamental human rights, does not deny the inevitable inequalities in endowment, brains, and ability among individuals. Only a spiritual and functional view of man in society can recognize and use these differences for the common good while respecting the essential equality of all. The secularization of Australian life, however, particularly in the sphere of education, had brought at least one generation of Australians to manhood with, at best, only a feeble knowledge of Christianity. To these, quite naturally, the concept of patriotism as a Christian virtue was unknown.

The sapping of the Australian spirit between the two world wars was further aided by the press, the motion pictures, and the radio—all of which reflected English and American ideas and discouraged the growth of Australian nationalism. However, worse than that, in general they depicted and glorified a philosophy of life which made earthly success and earthly happiness the sole criterion of right living.

I do not propose to examine here in detail the influences which enabled Aus-

tralia temporarily to rekindle the fire of patriotism during World War II. It will suffice to say that initially the response of the Nation was not a spontaneous upsurge of idealism fighting for right and, in fact, it was not until Germany attacked the Soviet Union that Australia was genuinely united in its war effort.

This unity, however, was not destined to last for long. When the war ended and the Western powers no longer had a common aim with the Soviet Union, Australia was split again. Once more our national spirit reverted to the condition in which it had weathered the 'thirties, but this time our status as a nation had changed to an extent which gave this condition vastly more significance.

The way in which we had acquitted ourselves during the war, plus the wider knowledge of our country resulting from the American and other "invasions," imbued us with a new national importance. For the first time, we found ourselves genuinely accorded a voice in the councils of the world—our opinions really seemed to matter. No longer were our gibes and criticisms regarded as the tantrums of a naughty child—people began to take them seriously.

Then we made a startling discovery. We found that concurrently with the recognition of our manhood we had forfeited the privileges of youth. As youngsters we had expected (and received) grateful thanks for lending a helping hand to others in distress; as men we were expected to play a man's part—to help ourselves and others, not as a bountiful gesture, but as a duty.

The implications of this change in status are not yet fully realized. There is still a considerable body of opinion in this country clinging to the belief that Australia should accept no commitments other than for her own defense and that our importance as a granary and main support area is sufficient to blackmail others into helping us merely to defend ourselves. I do not here criticize the politics or possibilities of this proposal, but I do criticize its morality. Nothing, I feel, could indicate more clearly that many of us have forgotten or never thought of the foundations on which this civilization of ours has been built. Adherence to such a concept indicates a callous disregard for others, a presumptuous evaluation of our own importance and a lack of sense of responsibility, all of which, together, spell death to idealism. In short, it indicates abandonment of the brotherhood of man—the Christian ethic on which Western civilization is based—and a return to the pagan outlook of the pre-Christian era.

Dignity and Responsibility

Australia, as it is today, has *no* national ideals. We have a civilization which was built on Christianity and we are vaguely hoping to maintain it on materialism or, alternatively, on nothing. It is like trying to run a gasoline engine on water. Before our eyes we see the moral character of the community declining. This is reflected not so much in the police records (although the picture they show is not a pretty one) but in the general decline in moral standards. Pride in craftsmanship is waning fast, honesty is becoming old-fashioned. The new aristocracy comprises the black marketeers, the professional gamblers, and the racketeers. There is around us a widespread revolt against discipline. Policemen are brutally battered by angry mobs or even by angry individuals while bystanders merely look on with interest or amusement. Even football umpires have to be guarded against physical assault by hostile barrackers. Our national motto is: "To hell with you, Jack, I'm all right!"

This is the atmosphere in which the recruit of today has come to manhood. If he has been able to salvage an ideal from the debris of modern life he is lucky, and the chances are he will make a good

soldier; if he has not been so lucky—which is most likely—he will tend to become a cartoon-type soldier whose toughness is an attitude rather than an attribute, a veneer without a baseboard.

Our problem is to find a means of investing the individual with a sense of individual dignity and responsibility. How is this to be done?

A Practical Solution?

The trouble with the modern, materialistic world is its tendency to believe that every solvable problem has a *practical* solution. By that I mean a solution which appears "down to earth," as opposed to one which belongs to the realm of philosophy. Unfortunately for this point of view, the practical solution is very often the one which appears unpractical simply because we have ceased to realize—for all *practical* purposes—the nature of man. Our Christian ancestors had no such problem. Rightly or wrongly, they had a clear-cut notion of man's origin and destiny and of the consequent dignity of the individual. In short, they believed that every man had a soul individually created by God and that, in the long run, every man was answerable to God and God alone. This concept (I am not here arguing its merits or demerits) asserted the essential equality of man in a manner that can never be paralleled in the social sphere. It gave to every man the sense of individual dignity which his being craves; it reminded him that he was a rational being with a conscience and with a free will to follow the dictates of his conscience—that he was, in short, as well equipped as any of his fellow men to fight the main battle of life.

This sense of individual dignity was quite naturally accompanied by a sense of individual responsibility—an awareness of duty not only to God but to one's neighbor; and this was the germ of Christian patriotism, loyalty, self-sacrifice, courage, and the will to fight for right.

If we are honest, we must admit that the recruit of today is poorer in raw material than were his ancestors. Physically, he may be superior, but morally and spiritually, which as we have seen is more important, he is undoubtedly inferior.

It is not my task to trace here in detail the reasons for this decline. No doubt, I repeat, it is largely due to the steady secularization of the state, chiefly in the sphere of education. When religious instruction was first banned from our schools its effects were not immediate. Both parents and teachers had been brought up in a Christian atmosphere and doubtless imparted many vital Christian principles to their children. With each generation, however, the effect has increased in geometric progression until today the child learns little or nothing about religious philosophy or ethics, either in the school or in the home. It is, therefore, small cause for wonder if the modern recruit lacks the spiritual qualities so essential in a good soldier.

As this is, beyond all question, a spiritual problem, its solution is only to be found in the spiritual plane. The truly practical man is, therefore, the man who appreciates this fact and who suits his weapons to the task.

It is a terrifying reality that, in our own generation, we have seen dictators mold the minds of youth to suit their purposes; that we have appreciated the enormous advantage that this has given them, yet we have done nothing in reply. In effect, we have said: "It would be wonderful if we could only train our people to believe in a cause but, alas, we have no cause for them to believe in!"

This is our despairing cry and it stems from our abysmal ignorance of our heritage—from our lack of knowledge of our way of life. Until this state of affairs is remedied on a national scale the average recruit will continue to be a spiritual moron and our army will lack the spirit-

ual strength which can only be nourished by a truly Christian community.

It may well be possible, however, for the Army to prime the charge—to set up a chain reaction which may revitalize the nation. However, it cannot be done in 5 minutes or even in 5 months; it must be a continuous process and it must be prosecuted with sincerity and with vigor.

Education and Example

I propose now to examine what can be done—what *must* be done—in order to produce an army that has the true strength of being spiritually equipped to fight. Having done so, I shall try to show *how* it can be done, having regard to the structure of our postwar Army as already planned.

It is important to bear in mind that, since this is a spiritual problem, its solution involves finding a way into the minds of men; in short, it is primarily a matter of education and example. Now "education" is not synonymous with "indoctrination." The former, strictly speaking, means "leading out"—in other words, training people to think for themselves; the latter, by contrast, means "to imbue with an opinion." These words, in a sense, summarize the difference between democracy and totalitarianism.

Men were not always educated. In far off days youths were taught only such essentials as to track, to hunt, to fish, and to build the rude structures which served as homes. In short, man learned only to survive in the world in which he found himself.

In time, however, as traditions and customs grew, the child could not learn all that was necessary by this method. As a result, the older men took it on themselves to instruct the young at certain times in traditions, customs, and group lore.

The increasing complexity of life eventually dictated the need for certain members of the group to become thoroughly familiar with the traditions and customs, and to devote most of their time to teaching the young. Thus, there came the first schools.

This system of schooling grew and developed through the ages until today society has said, in effect, that it recognizes the necessity of education for its preservation. Further, society has designated what shall be taught in schools and has asserted the right to certify teachers and to set standards.

This has led many to argue that the fundamental purpose of education is to train and mold individuals into service to the state. The entire educational system in modern totalitarian countries has been of this nature. It is controlled completely by the state and no one is permitted to do or teach anything except that which will contribute to the building of citizens who will devotedly serve the state and be obedient to the will of the ruler.

In democracies, on the other hand, educators have tried hard to preserve the individuality of children, feeling that insofar as the individual is permitted to grow according to his nature and deviate from the group, he is able to make a contribution such as will further group progress.

The mistake of the democracies has been that, in striving to preserve unfettered minds, they have, in many cases, created empty minds. They have, in addition, produced a disunity which even endangers their survival against the regimented minds of dictator states. Even the most ardent educationalist must agree that the need for survival takes precedence over the need to encourage individualism. Society itself in other spheres admits this fact and punishes individuals whose deviations take the form of transgressing laws made for the good of the people as a whole.

We may derive some consolation from knowing that this entire problem *can* be

solved—that it has been tackled and solved before. The West, impoverished and menaced, must now decide whether it will turn again or not to the source of its strength and restore its moral and spiritual community. The situation resembles that of the sixth and seventh centuries, when another great thrust came in arms out of the East. Christianity had to renew itself or die. It did not die.

There is no point in dealing with hypothetical situations when we can get down to actual cases. If we expect men to fight we must show them what they will be fighting for—what, perhaps without knowing it, they are already fighting for.

We must, therefore, educate men to an intimate knowledge of what divides the modern world. We must show them that it is not a mere conflict of political aspirations, but of paganism and Christianity—of spiritual serfdom and our way of life.

Foundation of Communism

Communism is predicated on the emphatic rejection of God. Communist man is pathetically dehumanized, severed from his divine origin and divine destiny. He is but a passing shadow of no duration, a fragment of no intrinsic or ultimate worth.

Now the denial of God will appear to many to be the least important aspect of communism, whereas, in fact, it is the most important and we must educate men to see why this is so. To deny God is to deny the moral law, which is the intellectual guide of our conscience. Consequently, the behavior of the atheistic Communist is unpredictable by Christian standards. To him the only good is the spread of communism, and he not only may but is *bound* to help this objective by every conceivable method, whether or not it involves lying, deceit, torture, murder, treason, or what you will.

Can we, then, get along with communism? Obviously we cannot get along with one whose whole being not only contradicts ours, but is bent on destroying ours. Therefore, when anybody in the West says, "We can get along with communism," then one of four propositions is true: (1) either he is a Communist himself; (2) or he is an appeaser; (3) or he does not know what he is talking about; (4) or—and this is the most grievous thing—he does not know the supreme values of his own heritage, which communism had radically rebelled against and desires to extirpate.

Social Significance of Christianity

We must, therefore, emphasize, and keep on emphasizing, the social significance of Christianity. Communists are not fools. They know that communism would surely wreck itself against a truly Christian front. That is why they seek to disarm Christians by spreading the myth that religious freedom exists in the Soviet Union, that Christianity and communism can live side by side. By subtle (and not so subtle) propaganda and every conceivable perfidy, the Communist must undermine the Christian view of man to prepare the godless soil which is necessary to the spread of communism. Only when man admits no arbitrator of the mind higher than the state will he tolerate his own enslavement.

It is, of course, idle to proclaim the virtues of Christian civilization and condemn the perfidy of atheistic communism if, by neglect, we are permitting our Christian ethics to drift away; if, in short, we are sliding into godlessness of our own volition. Our national leaders must arrest this drift by infusing Christianity into government. If Christian principles are used as a yardstick to judge the social justice of every governmental measure, there will be no dupes in our midst hankering after a Communist utopia. This is necessary if our way of life is to survive, but it is beyond the power of the Army to achieve it *directly*. We must aim, there-

fore, not only at influencing the minds of soldiers but the minds of all citizens. Our military leaders must impress the importance of this matter on our national leaders with the same vigor and persistence as they would press any other military problem, because, if the true strength of any army depends on it, it *is* a military problem.

Factors in Common

In considering what form our educational program must take, we must bear in mind the vital difference between medieval times and the present day, namely, the multitude of sects into which Christendom has since been divided. In Australia alone at the last census Christians showed themselves as belonging to no less than 21 major religions, plus a host of minor ones. Christianity might, therefore, appear to the sceptic to be a rather vague rallying cry. Such, however, is not the case. All Christian religions have certain factors in common which distinguish them from non-Christian religions and, above all, from atheistic materialism, and these common factors must be distilled and propagated. Only thus can we show clearly that our civilization depends for its survival on the survival of the Christian ethic.

Bolshevism claims to represent immutable principles. Although it regards earthly existence, the economic and social organization, as the final end of human life, it follows this belief with a zeal and a devotion that gives it the appearance of a religion, in comparison with which the frequent panegyrics of man's spiritual freedom and dignity, which carry with them no practical obligation, appear worthless and hollow. It is, therefore, impossible to combat bolshevism with arguments of a purely opportunist kind. Our way of life, instead of being a mere catch phrase which has no real meaning for many, must be codified and taught just as positively as totalitarian doctrines are taught, although not, of course, by the same methods. Only thus can we prepare the community to withstand the constant attack of propaganda which seeks to undermine our belief in ourselves.

Nor must the force of example, as a means of education, be overlooked. If the survival of the Christian civilization —the individual rights of man and social justice—be our ideal, we must be prepared to sacrifice ourselves to that end. An ideal that is not worth an effort is no ideal at all; it is just a dream.

A Task for the Leaders

Our leaders must show that they realize the importance of this problem and, by their unflagging example, awaken the faith of a nation that has been drugged by materialism for too long.

I have tried to show that our national ideal should be the preservation and development of Christian civilization, that is, the preservation of all that is good in our way of life and the incorporation in it of other good things that would follow if our national outlook were truly Christian. Unless this is our ideal, why should we resist the march of communism? What have we to muster against the burning faith of the Communist in the ultimate triumph of his creed?

Our way of life is far from perfect, but its imperfections are not due to Christianity—they are due to neglect of Christianity. We cannot, therefore, hope to perfect it if we lose sight of its foundations—if, that is, we forget that the survival of our civilization depends on the survival of Christianity.

What of the Army?

If the problem and its solution are as I have stated them, it will be apparent that the need exists for a national effort to remedy the situation by some positive action. A nation, however, is largely an abstraction and a national effort can only be an effort by its component parts. The question that faces us is: "What can

the Army do? How can we train our soldiers to understand the inner meaning of our way of life and show them just how seriously it is threatened?"

If we examine our Army as it is at present, the only worth-while fact that emerges is that any Army educational program can reach *directly* only a pitifully small proportion of our potential wartime army. Between October 1939 and September 1945, there were 727,703 enlistments in the Australian Army. This is a figure that we might reasonably be expected to duplicate or even to exceed in any future major war. By contrast, the total strength of our Army (excluding cadets) is now, in round figures, 40,000 which, incidently, is only 55 percent of its planned strength. Of the present actual strength, 20,000 belong to the Citizen Military Forces which are expected to carry out 14 days' home training and 14 days' camp training each year. The average attendance at training is approximately 50 percent. Our scope here is obviously limited and, in any case, it might reasonably be inferred that those men who join the Citizen Military Forces and faithfully carry out their training are those members of the community who already have some appreciation of the problem and who are making sacrifices in their country's interest.

The introduction of National Service is producing an annual intake of 27,000 who will be trained continuously for 14 weeks and thereafter complete their 3 years' service in the ranks of the Citizen Military Forces. It is this group that offers the best prospects for an educational program. Their minds will be receptive and they will be more influenced by the example of their seniors than would older men.

However, we must not limit ourselves to any particular group. As far as is possible, we must work on every officer and man whether in the Regular Army, the Citizen Military Forces, the National Service, or on the reserve. Further, we must interest the Navy and the Air Force in our task and try to pursue a uniform program throughout the services. Only by a widespread effort can we achieve our ultimate and vital object—to awaken the entire community to a realization of the fact that arms without spiritual armor are insufficient.

Charting the Course

I do not propose here to put forward a detailed educational program. Any such program would require considerable preliminary discussion and planning because it is most important that it should grip and retain the interest of everyone from the start. I shall, however, indicate in narrative form the general lines which I think such a program should follow.

The object of our educational program might be briefly stated as: "To codify and propagate our way of life." Our idealistic enemies spend limitless time and money in spreading the germs of their propaganda both at home and abroad. Their faith is foreign to the very nature of man and yet, by subterfuge and hard work, they succeed in convincing many people that it is something good and desirable. We, on our part, have a way of life which is attuned to man's true nature—which takes account of individual rights and individual dignity. However, unless we explain to people just what our way of life is—how it differs from that of totalitarian countries and how seriously it is threatened—we cannot expect them to understand it, still less to fight for it.

We must, therefore, begin by discussing in detail the rights and freedoms that we enjoy. To some this may seem unnecessary; they may argue that since we have these rights and freedoms we already know them or, at any rate, those of them which normally concern us. This, however, is not true. If you give a small

child a coin he will look at it with a momentary thrill of possession and will then probably put it into his mouth and finally discard it. There is a big difference in his attitude when he learns that that small disc of metal may be exchanged for ice cream or certain other delicacies. Similarly, the average citizen will appreciate our way of life much more when its evolution and meaning are explained to him, when he realizes that all his ancestors did not enjoy similar rights and privileges, and that his prospects of retaining them depend on the value he and his fellow men place on them.

Even if our program were to go no further than this it would, I am sure, achieve a great deal. After all, we are not striving to *indoctrinate* men with a theoretical ideal but to *educate* them to understand a way of life that actually exists and to show them how it came to be.

There is, of course, an inexhaustible field for further development of this theme, but I do not intend to attempt here any detailed program. I realize, in fact, that the preparation of a suitable program offers a considerable challenge to our educators, since it involves the reduction of history, philosophy, sociology, anthropology, psychology, physical geography, ethnology, and economics to a form that will interest and enlighten men of all standards of education. However, I have, I believe, indicated the general lines on which such a program should be built and any further elaboration would, at this stage, be pointless.

It would, moreover, be necessary to support any such educational program by making available adequate supplies of relevant readable literature. Education in any field is not a matter of filling minds with facts and details—it is a matter of teaching essentials, stimulating interest, and showing people how they can further their knowledge of the subject. There are innumerable books and pamphlets, both entertaining and instructive, which deal with various facets of Christianity and the part it has played in the development and growth of our social order.

These should be liberally sprinkled on the shelves of every Army library to enable soldiers to supplement the instruction given in lectures.

Unless we follow some such course of action, we are offering no counter to the propaganda of our ideological enemies, which daily, by every conceivable method, seeks to sap our Nation's will to fight.

Conclusion

There is not much point in being prepared to fight and die, if necessary, for the survival of our way of life unless we believe in our hearts it will progress to something better.

The soldier is dependent on the spirit of the nation. However, the soldier is no less a citizen than any other member of the community and, as such, must accept his share of responsibility for molding the communal mind. The Army, perhaps, forms the largest secular block of idealism that our country has, since no man joins in search of purely material prosperity. Is it not, then, logical that the Army should play a leading part in the war of ideas—that it should do its utmost to inspire all the creeds and classes which pass through its hands with a true national idealism?

History repeats itself only because men fail to learn from history. That our civilization is in imminent danger no thinking man denies. Whether, with the lessons of history at hand, we can save it from destruction only the future can tell; but this much is certain: if we live only for today we will surely die tomorrow.

Why Stalin Waits

Digested by the MILITARY REVIEW from an article by J. M. Spaight in "The Royal Air Force Quarterly" (Great Britain) July 1952.

WHY does not Stalin strike? It seems hardly to be in character that he should refrain. He sees a dozen or more nations rearming feverishly, a barrier of steel rising around him, a gathering of the clans of democracy, and all for one purpose: to keep him in check, to "contain" him. The process is far from complete. Why has he not interrupted it? He has had far larger forces than the West. He may no longer have such a great preponderance in a year or two. One would have expected him to move westward before he was hemmed in. Yet he has waited. Why? Is it that he was biding his time until the treaty for the European Defense Community had been signed by the six member states, including the German Federal Republic? Will the German participation be the last straw? Will it goad him into pouring his massed legions over the Elbe and on to the Rhine, claiming that only thus can he safeguard the Soviet Union from the danger that threatens her security? Or are all his great armaments, his bristling bayonets, and his paraded readiness for war only evidence of precisely the opposite intent to a warlike one and nothing but a huge bluff, inspired by a very real fear? One cannot tell.

Checks on Soviet Aggression

Mr. John Gunther, in his recent book on General Eisenhower, gives eight reasons for regarding a Soviet aggression as "not an imminent probability." They are America's larger stock pile of atom bombs; her Strategic Air Force and "the skein of air bases" from which it could launch an assault on the Soviet Union's industrial centers; the allies' command of the sea; the fourfold superiority of the United States in steel production; the remembrance of the 14 million casualties in the last war and the danger that a repetition of the carnage might lead to an internal revolt in the Soviet Union; the doubtful loyalty of Poland, Hungary, and Czechoslovakia; the hope that the German problem will be settled to the Soviet Union's advantage; and the belief that the Soviet Union's present tactics of cold war with limited aggression by her "proxies" is a better policy for her than formal war would be.

The Threat in the Air

Mr. Gunther refers to the threat of a strategic air offensive against the Soviet Union's industrial centers as a reason, *inter alia*, for her continuing inaction. No doubt that threat weighs with Stalin. Certainly there have been enough predictions of the fate which is in store for the large cities in the next war. What they suffered in the last war will be, we are told, nothing to what they will suffer in the next. One wonders, nevertheless, if this danger is as weighty a consideration in the councils of the Kremlin as it would be in those of a democratic government more mindful of the welfare of the people. Nor is the danger to the great industrial installations which might be put out of action taken very seriously. They are thought to be safe. "It would be treason even to hint that Magnitogorsk could be erased from the map or that Soviet industry as a whole could be put completely out of action." It seems probable that Stalin is thinking less of such dangers than he is of two other pillars of his Marxist temple, pillars whose collapse might bring the entire structure crash-

ing down. He cannot but be aware that the Soviet Union has two weak spots, blows at which would have a more disastrous effect upon her fortunes than any aimed at her towns or armament factories. They are her railway system and her oil resources. It was the bombing of these two classes of objectives by the British-American Air Forces in 1944-45 that shattered Germany's war economy. The two great campaigns against transportation and oil targets did more than all the attacks on the cities to bring about Germany's defeat.

A Lesson of the Last War

The attacks on them, the United States Strategic Bombing Survey considered, "contributed powerfully to the collapse of the Reich." They made the prospect of effective resistance to the allies' land invasion hopeless. The attack on the synthetic plants and refineries left Germany drained of oil. "The attack on transportation," said the Survey, "was the decisive blow that completely disorganized the German economy. It reduced war production in all categories and made it difficult to move what was produced to the front. The attack also limited the tactical mobility of the German Army."

In Japan, a sustained attack on transportation had hardly got underway at the time the war ended; and attack on the oil refineries became superfluous when Japan's merchant fleet was destroyed and oversea supplies of crude oil ceased. The air offensive was directed against the industrial towns, but, the Survey considered, it would have paid better to attack transportation. As it was, the United States Army Air Force did an enormous amount of damage to the centers of production, especially from March 1945 onward, when it began to drop incendiary bombs in very great quantities. In all, 160,800 tons of bombs, high explosive and incendiary, were dropped on Japan's home islands, nearly two-thirds of this tonnage being dropped on towns. Little was done to wreck rail communications. That, said the Survey, was a mistake. It estimates that 5,200 tons of high-explosive bombs, dropped on railways, tunnels, and bridges, would have strangled Japan's economy more effectively. "This strangulation would have more effectively and efficiently destroyed the economic structure of the country than individually destroying Japan's cities and factories. It would have reduced Japan to a series of isolated communities, incapable of any sustained industrial production, incapable of moving food from the agricultural areas to the cities, and incapable of rapid large-scale movements of troops and munitions."

Soviet Railways

The Soviet Union is more dependent on railways than Japan was, or is. Her roads and waterways are unusable for a considerable proportion of each year. In peace and in war alike, rail traffic is of vital importance to her, economically and strategically. To the Soviet Union, it has been said, her network of railways is what Britain's mercantile marine is to her. It links the isolated communities of her vast empire of the land. In war, its importance is all the greater because of another development of the past few years in the Soviet Union—the movement or establishment of industrial undertakings to or in the east and the consequent increase in the distances for which carriage of their products is necessary. The Soviet Union, says General Fuller, has adopted a policy of dispersion to secure her industries from air attack, with the result that they are remote from the probable theaters of war and the interlocking communications could be destroyed. "Actually, there would be no need to destroy the industrial centers themselves, for if the few main rail junctions of the USSR are put out of action, the

fewness of the railroads in most cases will render the deflection of traffic impossible."

One cannot doubt that if Stalin chose to wait no longer and decided to open an attack on the West, the Atlantic powers' first counterstroke would be an air attack not only on the Soviet forces massing for the attack, but also on the railways on which their reinforcement and supply would be dependent. Very early air action was foreshadowed in the event of Soviet aggression in General Eisenhower's report of 2 April 1952 to the chairman of the North Atlantic Treaty Organization. For ground defense, he said, 50 divisions would have to be provided, half of them being reserves available within 3 to 30 days. It was air power, he added, that was the dominant force in war today. "Our goal is to create air strength capable of answering immediately the onslaught of an aggressor and covering, at the same time, the mobilization of reserve forces. Since we cannot predict when an attack will be launched, air forces must be operationally ready at all times to rise to the defense of Western Europe." He said that the scheduled European air arm of the North Atlantic Treaty Organization would amount to 4,000 operational machines by the end of 1952, but that far more would ultimately be required.

Atlantic Air Power

The Atlantic powers will provide in due proportions the tactical air forces that will be in action at once if the Soviet Union strikes. General Norstad, Commander in Chief, Allied Air Forces, Central Europe, announced on 20 April 1952 that two tactical air forces had been established, the Second and the Fourth, the former being composed of British, Dutch, and Belgian units and the latter of United States, French, and Canadian formations. They should be able to give the Soviet fighters a very stiff fight for mastery of the air in the theater of war. The Royal Air Force, one cannot doubt, will be in the forefront of the battle. A good deal has been said about this country's failure to keep up the strength of the Air Force since 1945. Much of the criticism has been misconceived. What happened after World War I has apparently been forgotten. Then, our Air Force was allowed to run down to a far lower level than it was after the last war. On 14 March 1924, the Secretary of State for Air stated in the House of Commons that our first-line was then only 371 machines. After the last war, the Under-Secretary of State for Air stated in the House on 18 March 1952 that it was at one stage not much more than 1,000 aircraft. That was a very respectable figure. Conditions were different 30 years ago, but at least we allowed for the change to the extent that we retained nearly three times as large a first-line strength as we had done after the earlier war.

Strategic Air Offensive

The strategic air offensive will fall necessarily in the main to the Americans. They alone have the heavy bombers that could make it massive and overwhelming. We could help with our *Lincolns*, *Washingtons (B-29s)*, and *Canberras*, but these are only medium bombers by American standards, and it will be some years before the Vickers *Valiant* is in the line. Meanwhile, the Americans have their *B-36* and *B-47*, and before very long they will have the mighty *B-52* and the *B-60*. The Soviets have nothing to compare with them. Perhaps Stalin's hesitation is due in part to his knowledge, through his secret service, of what is happening in certain places in the United States, places of which the Russian people—and most of our own, for that matter—have never heard, but places where unimaginable tribulation is being prefabricated for the Soviet Union if she should be so unwise as to go to war. They are the places where the giant bombers are passing endlessly along the assembly lines: the huge plants around Seattle and

Los Angeles, those at Fort Worth in Texas, at Wichita in Kansas, at Tulsa in Oklahoma, and at Marietta in Georgia. It is here that is being forged the most tremendous instrument of strategic air power that the world has even seen.

Soviet Oil Supplies

Then, there is oil. "Oil," says Mr. John Fischer, "may well be Russia's economic Achilles' heel. Total output in the USSR and satellites comes to roughly 900,000 barrels a day, including synthetics, or only about 14 percent of America's production." The Soviet Air Force, he says, is so chronically starved for fuel that the pilots get relatively little flight training. The effect of a serious shortage also would have a disastrous effect upon the Russian people's food supplies. Agriculture in the Soviet Union is very highly mechanized and a plentiful supply of oil is needed to keep moving the tens of thousands of tractors which are at work on the farms. Something approaching famine conditions might be created if, say, the railways, pipe lines, and refineries in the Baku-Batoum region were massively bombed. They are far more exposed to attack than Magnitogorsk or the other new metallurgical centers. Stalin, as a Georgian, cannot but be aware of the danger to them, and it must make him think. He must know that the Western powers have the means of doing immeasurable damage to the most important of his oil sources, the Caucasus. Here, alone, is a sufficient reason for his hesitation to embark on the perilous adventure of a new world war.

Other Important Commodities

There are other commodities, too, of which the Soviet Union is short. She has to import rubber, cotton, wool, tin, tungsten, and molybdenum, and her production of coal and steel, as well as of oil, is far less than that of the United States. In heavy industry, too, North America and Western Europe have a great preponderance of capacity. Their war potential as a whole is far greater than that of the Soviet Union and her satellites. In a long war this would mean inevitably the defeat of the East. That probability cannot but have weight in the councils of the Kremlin.

In the question, Why does Stalin wait? there is the veiled implication that he intends to make war, but hesitates to begin. One can almost see a secretary going to him to jog his memory: "About that war, sir?" It may be so, but again it may not. It is impossible to be sure about what is in his mind, and it would be folly to be dogmatic. It is unwise at the same time to ignore the possibility that the Soviet Union does not intend a full-scale war at all and that all her elaborate preparations for it are only the backcloth for a drama in which others would be the players. They would be her dupes, her stooges, and the indoctrinated peoples in various lands who are foolish enough to rush in where she herself fears to tread. Wars like those in Korea and Indochina, and terrorism and banditry of the Malayan pattern, suit her book better than a global war. They keep the democracies preoccupied, force them to expend blood and treasure, and increase their difficulties in creating the armed strength which is being massed, according to the Soviet thesis, for aggression in the West.

A Remilitarized Germany

There are many Frenchmen who believe that if a third world war does come, it will be one begun by the same enemy who began the first and the second. They see a greater danger in a remilitarized Germany than in the Soviet armaments. They may be right and their fears should not be dismissed as wholly groundless. The German people as a whole will not rest content for ever with a situation in which their western and eastern provinces are separated. There is obvious danger in the rearmament of a Germany that is irredentist and dissatisfied, but, as a former Ger-

man general has pointed out, there is the safeguard for the present that her people's deepest desire is to be spared the sufferings of another war, and as long as the German units remain integrated in a supra-national army there is little likelihood of their making a lone attempt to recover Silesia and the other lost lands. For the time being, at any rate, we need the Germans on our side. They are good at the one thing which will be the most important thing in the world if Stalin should decide after all to wait no longer. It is the killing of Soviet troops. They did a lot of that in 1941-45. And it would be folly to conclude that it may not have to be done again. There is no certainty that Stalin does not mean business, and ugly business.

Adequate Defense Required

The way to prevent that from happening is for the free nations to continue to build up their defenses. The atom bomb alone may not deter him if he is set upon going to war; he may share the view of those who think that it has already gone the way of gas in war. The stronger and readier we are in all arms, the better is the chance that he will continue to wait and will not strike. The restoration of a balance of power in Europe will perhaps lead to a peace that may be an uneasy one but will at all events be better than another great war. That would only produce the confusion, suffering, and chaos in which communism breeds and thrives.

The Sabotage of Airfields by Airborne Troops

Translated and digested by the MILITARY REVIEW from an article in "Flugwehr und -Technik" (Switzerland) August 1952.

BY WAY of introduction it may be well to state that this article does not deal with the destruction of airfields nor with the action designed to make them unusable. Rather, it is the author's purpose to cover some of the aspects involved in surprise operations executed by parachute commandos or air-landed troops for destroying aircraft on the ground; individual, important airfield installations; or personnel.

Such operations, while considered by many to be insignificant or of only a harassing nature, can achieve worth-while results. This was proved on many occasions during the last war.

It may be argued that such tasks could be better accomplished by means of a bombing attack, but there are several factors which must be considered. First, enemy antiaircraft artillery fire may be so powerful that the attacking bombers may not be able to drop their bombs with accuracy. Second, targets such as planes, personnel, and small installations are difficult to hit, particularly if the attacking bombers are engaged in area bombing. Finally, an attack by bombers may destroy the entire installation so that it would be worthless in the event that it were subsequently captured.

Figure 1 provides a list of surprise operations conducted by British forces in the Middle East, and illustrates the results that were, and can be, achieved.

Although small-scale operations against airfields do not require a large force, they do require a great deal of planning and teamwork.

Figure 2 illustrates the method employed by a saboteur group against airfields during the last war.

The group was composed of 1 officer, 1 noncommissioned officer, and 18 men,

which was divided into several demolition groups and one or two cover groups. The demolition groups consisted of two men each. One man had the mission of placing the explosive charges and the other had the mission of protecting him. The cover groups consisted of three to five men each, armed with machine guns, machine pistols, and hand grenades. These groups had the task of covering the approach and withdrawal of the demolition groups.

DATE OF OPERATION	AIRFIELD ATTACKED	PLANES DESTROYED	PARATROOP LOSSES	
			KILLED	WOUNDED
JUNE 1942	IRAKLION	19	1	1
JULY 1942	BENGASI	5	7	2
JULY 1942	TANTA 1	9	0	0
JULY 1942	TANTA 2	7	0	0
JULY 1942	SIDI-EL-HANI	30	1	0
SEPTEMBER 1942	BENGASI	0	1	3

FIGURE 1.

3-1002

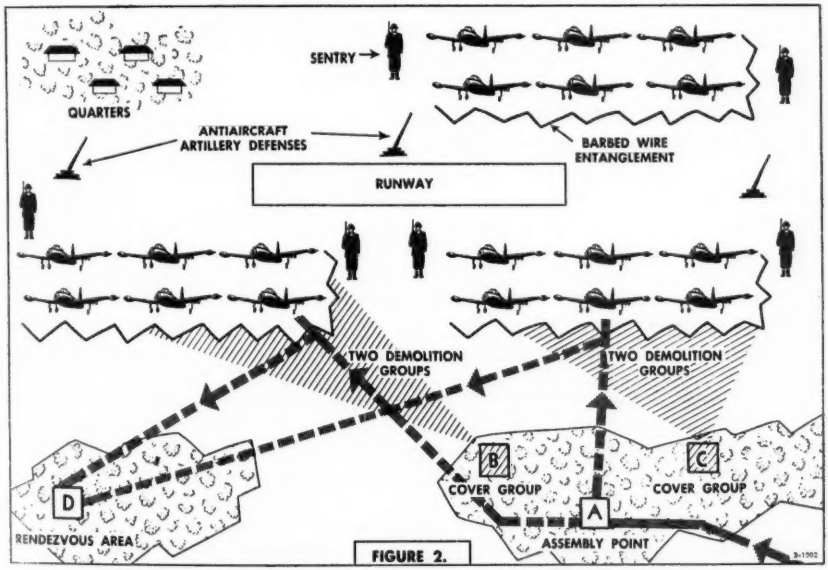


FIGURE 2.

After parachuting or being air-landed in the area, the group would assemble at point A, and remain there until a signal was given. When the signal was given, the demolition groups would move out toward their objectives, and the cover groups would take up positions at points B and C. The approach to the planes was often difficult and tiring, for there were generally many obstacles which had to be overcome. Absolute silence was maintained at all times. When the demolition groups reached the vicinity of the sentries,

the adance was made by crawling. If wire entanglements were encountered, passages had to be made through them. When the demolitions groups reached the aircraft, one member of each group would affix the explosive charges while the other member observed the movements of the sentries and provided protection for the man placing the charges.

Based upon a situation where five planes were to be destroyed, and with 0130 as the time for the first charge to be affixed, the following would be a normal timetable for the action:

First charge affixed at 0130 with a 30-minute delay fuze.

Second charge affixed at 0133 with a 30-minute delay fuze.

Third charge affixed at 0137 with a 25-minute delay fuze.

Fourth charge affixed at 0143 with a 20-minute delay fuze.

Fifth charge affixed at 0149 with a 20-minute delay fuze.

The withdrawal would begin at 0150, and the explosions would go off between 0200 and 0209.

It was extremely important that the boundaries of the zones in which the different demolition groups were operating were known to all personnel, in order to prevent any possible misunderstanding or failure. In case one of the groups was discovered and the alarm was sounded, the other groups would still complete their demolition work before withdrawing. If the situation required it, the cover groups would attempt to draw the enemy's fire, so that the demolition groups could continue their work. The withdrawal was accomplished in the same manner as the approach.

The rendezvous area, point D, was always different from the assembly point, but was located so that the demolition groups could be covered during the withdrawal.

Experience during the last war proved that small-scale operations against individual objectives at airfields can achieve decisive results, and can accomplish such tasks more efficiently than air attacks. However, to ensure success, planning must be detailed, and teamwork and co-operation must be developed to a fine degree.

NEXT MONTH

The next issue of the MILITARY REVIEW will feature the article "Mobility Unused," by Major General Robert W. Grow of the Office of the Chief of Military History, Department of the Army. General Grow presents a studied analysis of the actions of the XX Corps at the Moselle River during the Lorraine campaign. He points out that no principle of war can be neglected without paying a price, and that there is a relative value between these principles which varies with each situation. This difference, according to General Grow, is what makes war an art rather than a science.

"The Chinese Communist Forces in Korea," from *The Army Quarterly* (Great Britain), will be included in the "Foreign Military Digests" section of the magazine. This article discusses the organization and tactics of the Chinese Communist forces in Korea, with particular emphasis on the characteristics of their offensive and defensive operations.

Why Drill in Modern Military Training?

Digested by the MILITARY REVIEW from an article by
General Günther Blumentritt in "An Cosantóir" (Ireland) July 1952.

THE question of an acceptable modern form of military training continues to cause many headaches in most countries. Important people, both civilians and soldiers, have devoted much time to it and it may well be that the problem will become acute again in the near future.

Criticism of military training follows familiar lines. Again and again "this troublesome drill" obtrudes as the main bugbear. Dull, unimaginative drill fills many with a sense of foreboding when they recall the long hours spent marching or when they think of the endless rifle practice, and so on. This is not to be wondered at.

Drill Started Early

Let us just see why this "drill" developed from the earliest times in all countries and all armies. The Greek mercenaries of Xenophon and the disciplined and fearsome Praetorian guard and legions of the Roman Empire were just as pitilessly drilled as the various armies of later times. A severe form of drill and a very rigid parade ceremonial is still to be found in many armies today. Its original purpose was to influence the mind and an attempt was made, by external and mechanical forms of drill, to produce the desired state of mind in the soldier.

Influencing the Combatant

It has always been realized that not all soldiers are heroes. Everyone on the battlefield experiences a natural fear for one's life. It is not true that a soldier of any rank can go through one or two world wars without experiencing any fear whatsoever. Every one of us, even the bravest, has inwardly faltered at some time or other. Only the sense of duty, the example of others, and, perhaps, the discipline drilled into us have borne us through the ordeal. Thus, from the earliest times, it was thought to spare the soldier this strain by depriving him of his own will—indeed even by eliminating his power of judgment. Consequently, resort was had to various means of influencing the combatant. There was the intoxicating effect of march music on those about to attack, designed to intensify courage and obscure the unpleasant aspects of combat. There was the cavalry or infantry officer riding ahead or leading the advance with drawn sword. We recognize in all armies the symbolism of flags, eagles, and banners which were borne in front of the combatants. Every army had some kind of battle-cry, even if it was only "Hurrah."

All these devices were intended to act like a drug on the men and make them forget their fear. Drill was regarded as another suitable means to this end.

Drill Has Varied

When I became a soldier in 1911 drill still played an important part in training. We, however, were told by our then superiors that the practice of drill had formerly been much more intensive. After World War I, there was a considerable reduction in drill, by comparison with the prewar period, and the drill forms were numerically decreased and simplified in their execution. Subsequently, things became even more lax. Contemporary opinions regarding the amount of drill to be done are, therefore, very varied, depending on the experiences one has had during the years. There was, however, another reason why drill was necessary in former times.

Up to 100 years ago, almost all fighting was done in closed formations, as dictated by the primitive, short-range weapons then in use. Open combat with lines of infantrymen in extended order had not yet been accepted as generally advisable. Most of the shooting was in the form of volleys, and, thus, in combat as in firing, the greatest accuracy was required in all movements and in the handling of weapons. For this reason, combat in former times really consisted of "drill" and all movements followed on sharp commands. The armies of the past were, therefore, all compelled to drill rigorously. The army which was best drilled had great advantages.

The army of Frederick the Great differed from the French, Austrian, Russian, and Swedish armies of the time only in that it was still more severely drilled. The English forces in particular were then in no way inferior to the Prussian. Thus, drill was a very wise measure since combat, as already stated, was based largely on it.

Influence of Weapons

During the nineteenth century, weapons became increasingly effective and had greater range. This led, of necessity, to more open combat and greater exploitation of the terrain. With this development the old method of drill gradually lost its meaning and had to be replaced by something else, namely, education, independence, and a sense of responsibility and initiative.

This open order in combat had extended extraordinarily even before 1914 for it had become apparent that close order would no longer be possible under intense fire. World War I saw a great advance in technique and it is only today that we can properly recognize the completely open order method of combat based on the individual action of the soldier and the utmost exploitation of the terrain. In addition, in recent times, there has been a considerable increase in popular education in comparison with the widespread illiteracy of former days. The internal development of the state has also produced different aims to those of 150 years ago. All these circumstances have, to a great extent, deprived the old form of drill of its importance. If one wishes to use every means possible to create the independent, responsible individual combatant, acting according to reason, one must not jeopardize the success of his efforts by any undue emphasis on dull, spiritless drill.

Teamwork Required

Modern war involves the combination of all weapons. Many weapons require "collective" handling. The machine gun, the artillery piece, the tank, and the bomber must be operated by a team. Combined effort is essential, as in a football game. In addition to this, modern combat consists, in a tactical sense, in the skillful co-operation of the individual combat teams, sections, and companies, and all this in turn requires understanding and judgment. Moreover, grand tactics are, in the long run, nothing more than the co-operation of larger units in achieving a certain objective. Thus, "rifle practice" and "individual drill" are no longer of any value under modern conditions.

Sport and Combat

One should not, however, reject the good with the bad. During the period of basic training, a moderate amount of drill is indispensable. This is exactly what happens in other armies. However, the time spent on drill must remain restricted and the few drill forms which are left must be as simple as possible in execution. Moreover, only such forms should be preserved as are indispensable even in peacetime. To a great extent, the old form of drill must be replaced by an intensive type of

military service in which sport and combat are closely identified.

Modern youth shows great enthusiasm for sport and it would regard military service in a very different light if it were voluntary. A really good football match requires just as much discipline, combination, purposefulness, energy, endurance, skill, and so on as does modern combat.

The collective handling of weapons can be conducted on the lines of a sport, provided there is a brief preliminary period of practice in the essentials. The same is true of the co-operation required in minor tactics by lower formations in combat. It also applies to rifle practice which, after a short period of formative instruction on the same basis as if it were a sport, shows much better results than the training drilled into the men at the battle-school.

The barrack-square and the old-style drillground have long since been replaced by the training area with natural terrain as the main scene of action of the modern military force in training. It is there that preparation for combat is really carried out and not on the parade ground.

Basic training also can be modernized. It would be best if, following his introductory statement of fundamentals and aims, the instructor were to let the pupil do most of the talking. One has only to try out this experiment by talking over an interesting combat situation with his men. You will be astonished by the number who display excellent judgment and develop new ideas. A further advantage of such "free" instruction is that the timid are encouraged to express themselves and a teacher, applying psychological methods, can convert such "Cinderellas" into self-confident soldiers. Instruction can only be of practical value if it is perceptive and if it employs all possible aids—above all, training films. Sport in the army made great progress after World War I. It only needs to be adapted to the present time and should, in particular, embrace such games and sporting activities as serve the purpose of military training under active conditions. Most games are based on the "collective principle" and this, as already pointed out, is an essential requisite for the modern fighting force.

Modern war is a work war, a war of detailed planning, of specialized equipment, of long hours of drudgery, while still a war of courage and of death. The advent of the machine has made war the total conflict that it is. Nations, not armies, go to war. In preparing for a lifetime of service, our professionally trained military graduates must train not only for leadership in battle, but also to provide leadership for the Nation in adapting the resources of science and education to our national needs.

General of the Army Omar N. Bradley

BOOKS OF INTEREST TO THE MILITARY READER

DEMOCRACY AND THE ECONOMIC CHALLENGE. By Robert M. MacIver. 86 Pages. Alfred A. Knopf, New York. $2.50.

By CAPT WILLIAM H. BEAUCHAMP, *CE*

Just as many historians and other social scientists feel that the world's basic problem is society's adjustment to the Industrial Revolution, America's primary domestic problem is widely considered to be the meshing of her democratic principles with the challenges inherent in the sweeping changes in our mode of living brought about by our ever increasing industrialization. This meshing of political and economic forces is the subject of Professor MacIver's book.

He introduces his subject by a historical study of the rise of public and private economic power and goes on to show how private economic power which was made possible by industrialization has in turn made democracy as we know it possible by the creation of a middle class with great political and economic strength whose economic strength is independent of land ownership.

The basic fallacy of Marxism, which destroys this independence of private economic power, is illustrated, the inherent dangers of extensive economic planning are pointed out, and the author ends with a plea for a moderate point of view which accepts many features of the "welfare" state but rejects wide-scale planning. This book should be of interest to military men whose reading time for material of this type is somewhat restricted, for it is concisely, clearly, and authoritatively written.

THE ATOM SPIES. By Oliver Pilat. 302 Pages. G. P. Putnam's Sons, New York. $3.50.

By MAJ GREY DRESSER, *Armor*

The tangled skein of Soviet espionage in the United States, Canada, and Britain, which resulted in furnishing the Kremlin with much vital information concerning the atom bomb, is presented in an integrated form in this book. Case histories of Harry Gold, Klaus Fuchs, Bruno Pontecorvo, Allan Nunn May, Ruth and David Greenglass, and the Rosenbergs are outlined together with those of lesser lights.

The author is primarily interested in the motivation behind the individuals, and points out the neurotic personalities of most of the key figures in the drama. The Americans involved were for the most part children of immigrants, reared in the slum areas of the Eastern cities, who reached maturity in the depression years of the early thirties, while the naturalized Britons—Fuchs and Pontecorvo—emerged from the bewildering economic and political chaos in Europe between the wars. The treason they committed is traced by Pilat to their abnormal psychological backgrounds.

An interesting theory suggested in the Fuchs case is that his confession may have been deliberately timed to cause friction between Great Britain and the United States. A plausible case is made for this theory, and whether the reader accepts this completely, he will find in this volume an excellent tying-in of the many divergent elements in this greatest of spy stories.

TOTAL EMPIRE. The Roots and Progress of World Communism. By Edmund A. Walsh, S. J. 284 Pages. The Bruce Publishing Co., Milwaukee, Wis. $3.50.

By COL GEORGE C. REINHARDT, *CE*

Tracing the theme of geopolitics today leads naturally to reflection upon Soviet aggression. This recent book by Father Walsh covers the latter phenomenon as his earlier *Total Power* dwelt principally upon the former. Like its predecessor, *Total Empire* is based upon an impressive array of personal experience and extensive research.

Excellent mental fare, the volume is nevertheless not easy to digest. Lessons drawn from Russian history; the place of the Russian people in the Communist empire; and particularly a new version of preventive war, termed "defensive attack," will invoke a wide divergence in reader reactions.

FORMOSA UNDER CHINESE NATIONALIST RULE. By Fred W. Riggs. 195 Pages. The Macmillan Company, New York. $2.75.

By LT COL GEORGE W. MCCAFFREY, *Inf*

When the Chinese Nationalist Government assumed control of Formosa in October 1945 there was small realization that this island, located approximately 75 miles from the mainland of China, would assume the significance that it now holds in the future military and political situation in the troubled Asiatic area.

Dr. Riggs presents a very inclusive insight concerning the military, economic, political, and social developments which have involved Formosa and its 7,600,000 inhabitants during the past 6 years. He places particular emphasis upon the period when this island became the last bastion of the Chinese Nationalist Government of Chiang Kai-shek.

Since the outbreak of hostilities in Korea, the United States has been concerned in the present and future military, economic, and political aspects of Formosa. Further developments in the Far East are certain to invoke more attention to this hitherto supposedly unimportant island. Considering our limited background of this area, this book provides an interesting and very timely appraisal of the Formosa of today.

THE KOREA STORY. By John C. Caldwell and Lesley Frost. 180 Pages. Henry Regnery Co., Chicago, $3.00.

By LT COL WALDEN F. WOODWARD, *Inf*

Mr. Caldwell has not told the Korea story. He has written a timely and interesting account of his experiences with the United States information service in Korea from 1948 to 1950. His accounts of the organization and operation of an information service, of the supervision of the first Korean general election, and of the smuggling of anti-Communist leaflets into North Korea are of special interest. His severe criticism of the United States State Department must be weighed in connection with the circumstances of his resignation from that governmental agency.

This book offers many practical lessons for those who are engaged, or will engage, in military government and military occupational duties.

NAVAL TERMS DICTIONARY. By Commander John V. Noel, Jr. 247 Pages. D. Van Nostrand Company, Inc., New York. $4.50.

By CAPT DAVID J. WELSH, *USN*

This is an excellent dictionary of words and phrases in everyday usage in the United States Navy. By careful editing and restriction to *commonly* used words and phrases peculiar to the Navy, the book has been held to a size that will permit its use as a handy reference. A cross-reference system adds to the book's convenience and value. Definitions are concise and clear and presented in an interesting and informative manner.

MASTER SPY. By Ian Colvin. 263 Pages. McGraw-Hill Book Co., Inc., New York. $3.50.

By LT COL DANIEL A. NOLAN, JR., *Inf*

Traitor or patriot? Admiral Wilhelm Canaris, the Master Spy, was the Chief of Intelligence Services of the German Armed Forces just prior to and throughout World War II until July 1944. He was undoubtedly a traitor to Hitler, as Mr. Colvin has very ably indicated; but in his treason he was paradoxically a true German patriot attempting to save his country from the utter destruction he wisely knew the war would inevitably bring to pass.

The book gives a brief of the organization and background of the German intelligence service, relates some of the history of the undercover intrigues that had an important bearing on Germany's relationship with Poland, Russia, and Spain, and tells a few anecdotes of the early career of Canaris and his later activities in Spain. The stage having thus been set, the curtain is drawn back on Canaris' remarkable role of unofficial double agent, a role in which he ably and efficiently carried out his responsibility to provide military intelligence to the Nazi government and its war machine and, at the same time, worked with suave discretion to accomplish the overthrow of Hitler in the best interests of Germany.

Page after page of *Master Spy* is filled with anecdotes of the amazing activities of Admiral Canaris and his people. It is impossible to select any one, really, and say it is more outstanding than the rest. In sum, however, they all serve to point out that the title might rather be "Spy Master"; for although the Admiral was addicted to doing his own clandestine business whenever possible, he was chiefly remarkable for the way in which he organized and operated a far-flung network of undercover agents.

Master Spy cannot be classed as "required" reading for the military student. But it is a vastly entertaining, very well-written piece of obscure history, an amazing account of the scenes behind the curtains of military and political secrecy, and an admirable study of one of the great unknown figures of World War II. And as the execution of Canaris for complicity in the plot on Hitler's life is related, the reader cannot but wonder again, "traitor or patriot?" But he will probably conclude, as in the words of the author, that "Wilhelm Canaris has done his duty according to his own lights."

ACROSS TO NORWAY. By David Howarth. 286 Pages. William Sloane Associates, Inc., New York. $3.75.

By LT COL GEORGE E. LARSEN, *QMC*

A fleet of small fishing boats, manned by Norwegian sailors in exile, performed one of the most hazardous and heroic underground operations of the last war. Using the Shetland Islands as a base, they smuggled arms and equipment to occupied Norway across hundreds of miles of open ocean.

Some of the journeys covered 2,000 miles and lasted as long as 3 weeks. All of them, since they needed the protective screen of darkness, were made in the subarctic winter in the stormiest seas of the world.

This modern saga, as the author calls it, is a simple presentation written without sensationalism of individualistic seamen who had the solid courage to triumph in spite of the odds against them.

GENERALS IN THE WHITE HOUSE. By Dorothy B. Goebel and Julius Goebel, Jr. 276 Pages. Doubleday & Co., New York. $3.00.

THE SECRETARY-GENERAL OF THE UNITED NATIONS, His Political Powers and Practice. By Stephen M. Schwebel. 299 Pages. Harvard University Press, Cambridge, Mass. $4.75.